JUNE
1953

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for men who manage

CHEMICAL PROCESSING

Highlights

of This Issue

"Carloads per week" of 70 — 72% perchloric acid being made in all-glass plant 8

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Du Pont's CRAWFORD H. GREENEWALT
PIONEER of PROGRESS in Synthetic Fibers

The Cover Picture

Du Pont's Crawford H. Greenewalt — he worked with the group that first surpassed Nature in producing textile fibers. For the story of fibers with functional design see article on . . . . . page 6

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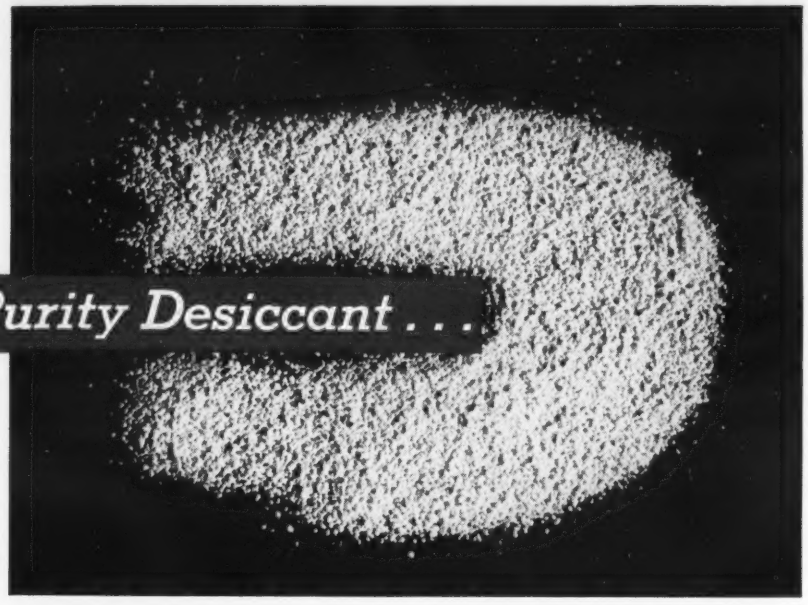

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"That's Interesting"

Mountains may come to Mohammed

The problem of moving a 1900-ton water tower was an imposing task, which recently confronted an English, Contracting Co., L. Kier & Ltd. The eighty-foot high concrete structure had to be moved three hundred yards or be destroyed. In response to this challenge, the company devised a plan whereby the tower could be cradled in a concrete structure and pulled along a series of railroad tracks. The

You're next!

track consisted of continuous ball races made up of ordinary bullhead section railway lines laid on their sides one above the other. Between them were about eight hundred bearings (two and half-inch diameter balls). Using a Caterpillar tractor with a ten to one block and tackle reduction, the concrete tower was over its new foundation in four weeks. Moreover, the projected scheme was estimated to cost about half as much as the cost of building a new tower at the new location.

Air stream separates particles into .0001" diameters

Particles so fine that more than a thousand could line up single file across the head of an ordinary pin are being separated by a device developed by General Electric Research Laboratory, Schenectady 5, N.Y. Without using any wire screen, the powder is blown upwards through a vertical seven-foot glass tube. At first only the finest particles (.0001" diameter) reach the top and are removed. Afterwards the air velocity is increased and larger grains (from .0001-.0002" in diameter) are collected.

Machine may choose to reproduce itself

Plans have been devised for a theoretical machine which will collect parts from its environment and assemble them to produce a second machine of the same type, which then starts collecting parts to construct a third machine and so on. At present, the device is a mathematical model and will probably remain so until someone can devise a suitable use for that many machines.

CHEMICAL PROCESSING

(CHEMICAL PROCESSING PREVIEW)

For MEN WHO MANAGE

Vol. 16 June, 1953 No. 6

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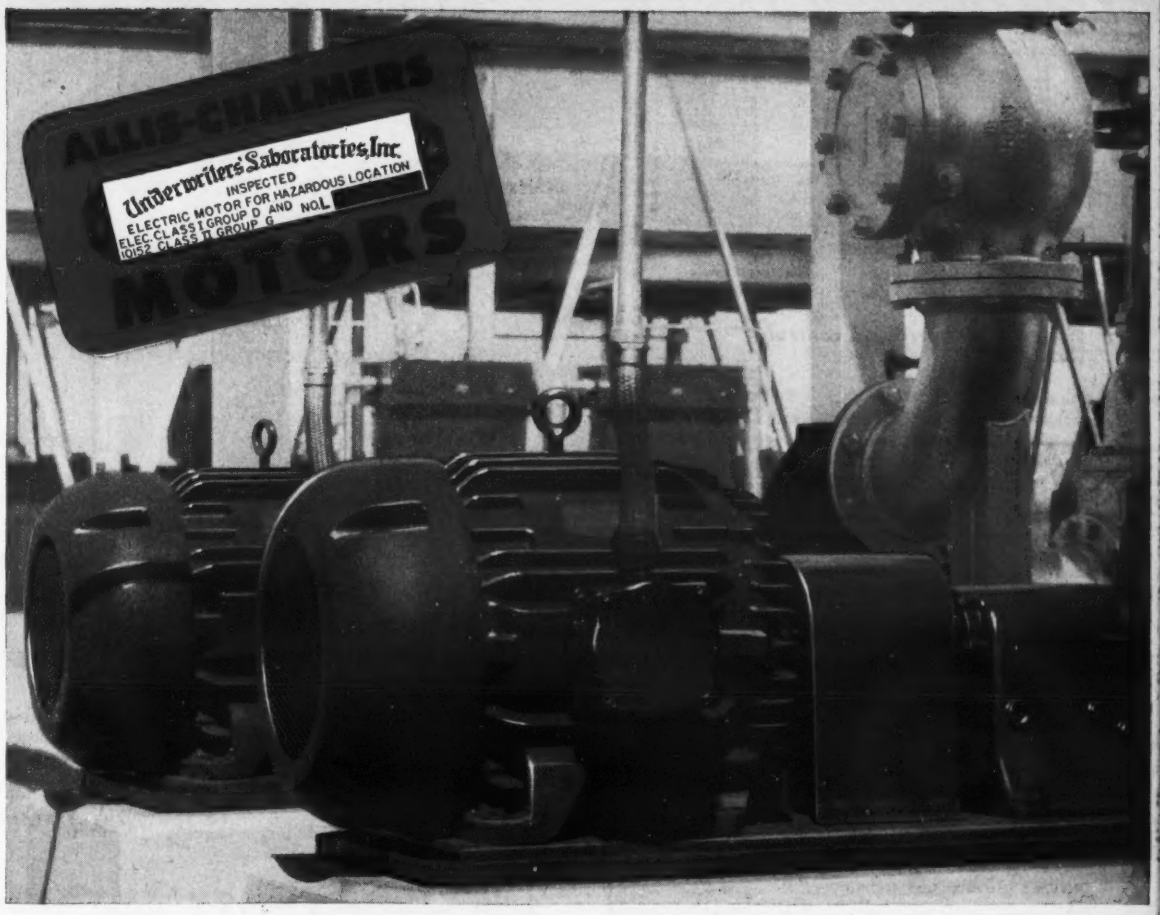

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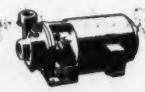

PUMPS — Integral types from ¾ in. to 72 in. discharge and up.

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In this Issue

corrosion control

Although CHEMICAL PROCESSING carries a number of articles on corrosion every month, the June issue, pages 82 to 93, contains a separate section on corrosion control, a subject which is being given increased emphasis in industry.

Included in this section is material from the most pertinent of the 44 technical papers delivered at the recent National Association of Corrosion Engineers Conference and Exhibition in Chicago. Some features of the Exhibition, as well as articles on how individual corrosion problems have been solved in chemical plants also appear in the section.

In the past, efforts have been made to prevent corrosion and have met with a certain degree of success. More generally, however, corrosion has been considered as just something one had to expect and put up with as a normal part of chemical operations. Only recently has it become evident that some of the most severe corrosion problems can and are being overcome with the many newly developed products and techniques.

Not many years ago, it would have been undreamed of for pumps to handle 30% hydrochloric acid at temperatures up to 104°F in continuous operations without considerable corrosion. However, that type of performance has been achieved by plastic pumps for periods extending up to nearly three years at present, pages 82 and 83. Moreover, experience with the pumps has been so foolproof that not a replacement part has been needed.

Not only plastic pumps, but also plastic pipe, protective coatings, rubber linings, alloys, aluminum, titanium, tantalum, vanadium, ceramic coatings, and inhibitors are being used to combat corrosion. All of these tools and many more are being used to reduce the billions of dollars being lost to corrosion each year. No longer is corrosion accepted as a necessary evil — it is being actively fought on many fronts.

We know that you men who manage chemical operations want to be certain that you have all of the weapons against corrosion at your command. We bring you articles on the latest developments in the many fields of corrosion control in this issue and shall bring you more in the future. We believe that you will find this information of interest.

Gordon Weyermuller

ASSISTANT EDITOR

editorial highlights

Quick cooling and dry-air conveying protect spray-dried resins' quality — 12

Porcelain's hardness approached in latest silicone baking enamel — but it's flexible — 24

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Chemicals as Catalysts in the Nation's Economy

This editorial has been written at the request of the editors of CHEMICAL PROCESSING . . . and is authored by

DR. N. N. T. SAMARAS, Director of Research
Central Research Laboratories, Monsanto Chemical Company

Received B.S. in chemical engineering from Case Institute of Technology and Ph.D. from Yale University, 1931. Undertook post-doctorate research work at Yale from 1931 to 1934.

In 1934, Dr. Samaras joined Thomas & Hochwalt Laboratories, which Monsanto acquired in 1936. He served progressively as Research Chemist, Group Leader, Asst. Dir. of Central Research Dept., Dir. of Research for Plastics Div., and, since 1950, he has functioned as Dir. of the Central Research Dept.

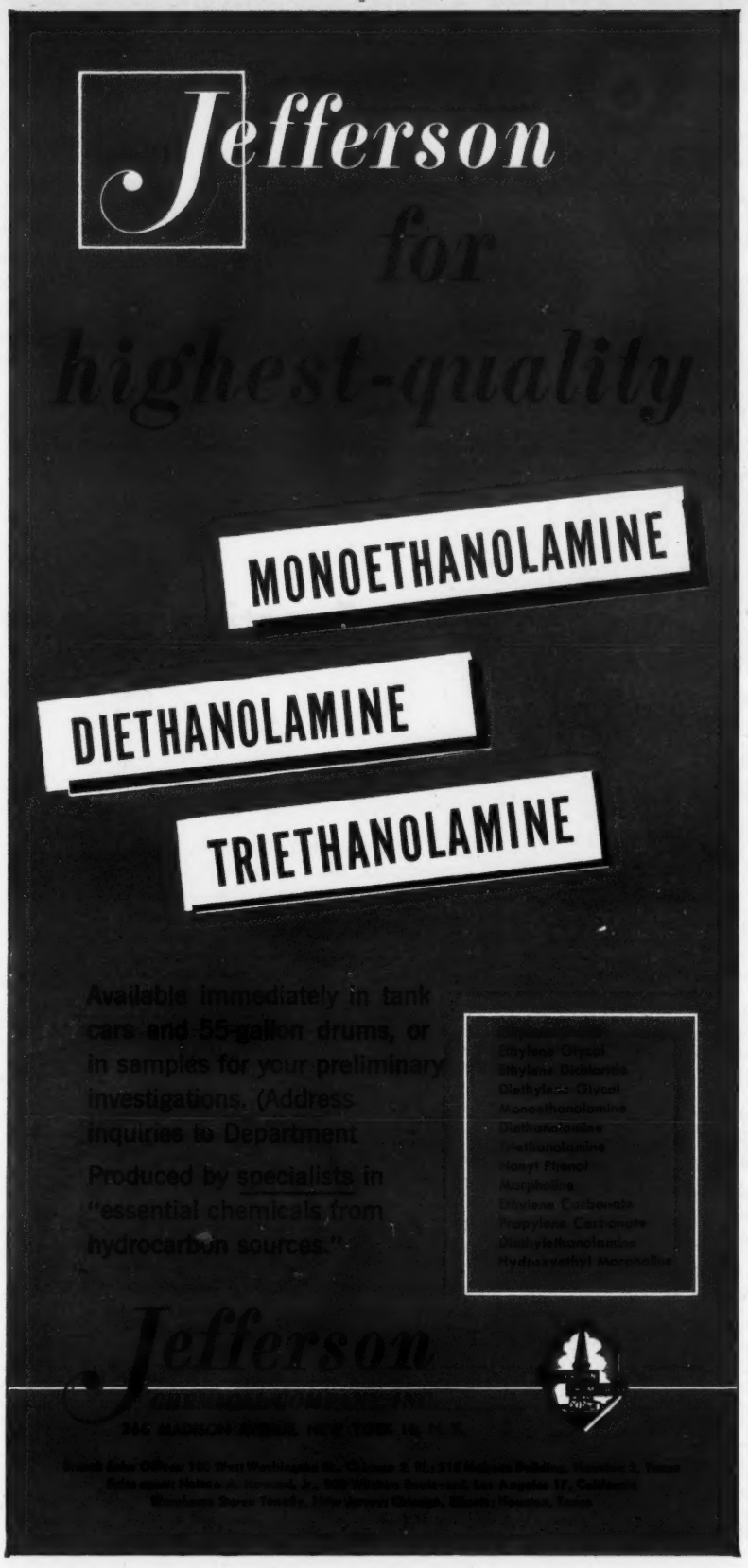
In addition to the Central Research Laboratories, Dr. Samaras is in charge of the Mound and Scioto Laboratories which Monsanto operates for AEC.

THOUGH the phenomenal growth of the chemical industry has come about as a result of technological progress, new products and greater productivity, the increased sale of chemicals has not been entirely at the expense of existing industries: rather, the chemical industry has stimulated — even made imperative — an accelerated tempo in other industries, and has often given impetus to the birth and growth of completely new industries.

The dynamic nature and versatility of the chemical industry can be illustrated by developments in three fields: agriculture, fibers and plastics. It will be seen that new discoveries open additional vistas for exploration and thus catalyze not only the continuing progress of the chemical industry but also the national economy.

In the past 12 years, we have all witnessed the meteoric rise in number, variety, and volume of products which the chemical industry has created for agriculture. Since the advent of DDT in 1942, insecticides such as methoxychlor, benzene hexachloride, toxaphene, dieldrin, aldrine, and parathion have been synthesized. It is important to remember that these compounds did not put older insecticides "out-of-work;" but created new markets because they satisfied long-felt needs. Organic herbicides, such as 2, 4-D and 2, 4, 5-T, were introduced to selectively destroy weeds that might otherwise sap our soil, choke our crops, overrun highways, harbor insects, and encourage our allergies. We have aided the farmers by formulating systemic insecticides to reduce the number of sprayings and to selectively kill harmful insects, hormones to control plant growth, and polyelectrolytes as soil conditioners to encourage produc-

(*Continued on page* 208)



Briefs

From recent literature

No. 4 in a Series

Corrosion of steel by natural oil field brines containing hydrogen sulfide has been reduced in tests by the addition of corrosion inhibitors including the reaction product of diethanolamine and formaldehyde, and the reaction product of monoethanolamine and formaldehyde. The concentration of the inhibitors in the tests was 62½ ppm.

Thermo-plastic synthetic polymers which are free flowing, have a high dry solid content, stability on standing, and which, upon evaporation, yield a continuous tough and adherent film with a low degree of opacity free from hydrophilic colloids may be prepared by employing an emulsifying agent such as the ethanolamine salt of a sulphate of a fatty alcohol. The emulsifying agent is used in conjunction with a stabilizer and a surface tension reducer in dispersing the monomeric substance in an aqueous medium.

Textile lubricant suitable for use as a single application lubricant for cellulose acetate staple fibers and similar cellulose materials consists of a partial ester of phosphoric acid with a long chain aliphatic acid, an ethanolamine, such as diethanolamine or triethanolamine, an alkylolamine ester of a long chain aliphatic acid, and an alkyl phenol all mixed into mineral oil in suitable proportions.

Silver containing germicides which are water-soluble, non-toxic and non-staining can be prepared for use in ointments, unguents, etc., or for incorporation in latex products, bristles, textiles, resins, etc., to make them essentially self-sterilizing. The germicide can be prepared by reacting silver chloride with monoethanolamine.

These developments are abstracted from recent publications or U.S. patents. They may suggest applications of Jefferson Ethanolamines in your products or processes.

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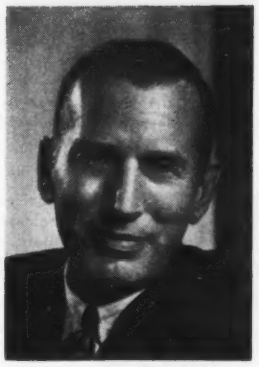
PIONEERS OF PROGRESS

The twentieth century marks a revolutionary change in man's accomplishments . . . the history of textiles and clothing, for example, shows that man has appropriated and adapted whatever was handy until recently. To Carothers, Greenewalt, Izard and hundreds of other Du Pont men must go the credit for giving us . . .



CRAWFORD H. GREENEWALT

Functional Synthetic Fibers

A Triumph of Chemistry

" . . . MAN'S ABILITY to think creatively is the characteristic that sets him apart from the lower animals . . . . it is incontestable that all contributions to the betterment of mankind have their origins in creative thought, whether it be in laboratories, in offices, at home or in church, or under Mr. Newton's apple tree." The words are Crawford H. Greenewalt's: the sentiment seems to be one he shares with the company of which he is president.

The fiber and textile revolution that has been increasingly important in recent years is a prime example of creative thinking. Not only has it finally allowed us to assert some independence of the lamb, the silkworm, the cotton plant, but has provided us with the means, and in some cases the ends, of fibers and materials to do a particular job without reservations and drawbacks common to natural fibers. The rapidly rising curve of "synthetic" fiber production attests the importance of properties and performance of fibers designed for their use rather than adapted to it.

Synthetic Fiber Boom

Chardonnet first produced rayon commercially in France — the year was 1891. Despite the fact that he got his idea from watching a spaghetti machine, he was no tinkerer. There was a real reason behind his work to produce synthetic silk in quantity. An important raw material for French factories, silk was subject to drastic price and supply fluctuations.

Rayon was first produced here in 1911 and Du Pont's Fibersilk in 1921. "Acele*" acetate was introduced in 1929 when — despite the onset of the depression — synthetic fiber production was over 100 million pounds a year. By the time nylon was announced in 1938, 300 million pounds of rayons were being consumed each year. And at the time "Dacron*" and "Orlon*" were introduced in 1948 and 1950, respectively, it was apparent that the curve had an "upswing" . . . synthetic fiber consumption in those two years was 1.2 billion pounds plus and 1.5 billion pounds, respectively. Why did such a tremendous market for these synthetic fibers develop when cotton, wool, and silk were as available as ever? The reasons were many.

One of the first apparent reasons for switching to nylon for women's hose was paradoxically, price. At the time that nylon was announced, it sold for $4.27 a pound. Silk, at the time, was selling at $2.79. No financial acumen was needed to see the handicap under which nylon entered the market. But what is not apparent from these figures is the fact that silk fluctuated (shades of Chardonnet) from about $1.50 to $3.00 a pound — and frequently with sickening speed. Nylon possessed not only a stable price-and-supply asset, but two other important advantages: the price of any chemical product usually decreases as volume production is reached, and second, women's legs looked good in nylon.

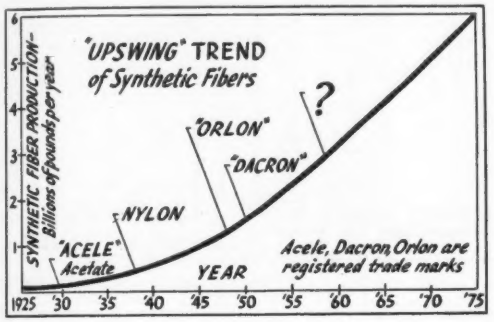
Of course, there were important factors in the growth of synthetic fibers indirectly or not at all connected with the consuming public. Auto and airplane tires (and Du Pont produced the rayon for the cords in big bomber tires — 149 miles of

it in each tire), military parachutes, industrial filter cloths . . . have all had their part in boosting synthetic fiber production to its present heights.

Creative Thinking

Rayon was born of an attempt to imitate the silkworm. Nylon and later fibers were not imitations — they were *created* to surpass natural fiber properties. But before the "superpolymer" idea got to the stage where superior fibers were considered a possibility, there was basic research . . . creative thinking applied to the "whys" and "hows" of chemistry.

It was in 1927 when Dr. Stine, then director of the company's Chemical Department, started to set up a research program in "pure science." His goal: to fill in gaps in existing chemical knowledge and to



find new facts that might lead to development of new products. One of his first moves was a wise one; he persuaded Wallace H. Carothers to work on the project.

Carothers attacked the problem of polymerization . . . the union of small chemical molecules as links to build giant chain molecules. And it was not long before he had made polyester chain-molecules with molecular weights ranging from 2300 to 5000. These molecules were still too small to be of particular interest.

Attention was then directed to making polyesters of even higher molecular weight. These "superpolymers" — chain-molecules with molecular weights above 10,000, some even above 25,000 — proved to be the first synthetic products from which strong, elastic textile fibers might be spun. They had, however, several defects — their melting points were too low, they were too sensitive to water, and they were too generally soluble in organic solvents.

Simultaneously work in the field of polyamides indicated the ability to improve upon the polyesters with respect to these defects. A number of polyamides and polyester-polyamides confirmed this but the products were so refractory as to discourage easy conversion into fibers. In fact, things looked so dark that work was suspended for several months. Then, on the last day of February, 1935, Carothers found the superpolymer — a polyamide — that was to become commonly known as nylon. Tests established the value of the "superpolymer 66", as it was called, and

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(*Continued on page* 210)

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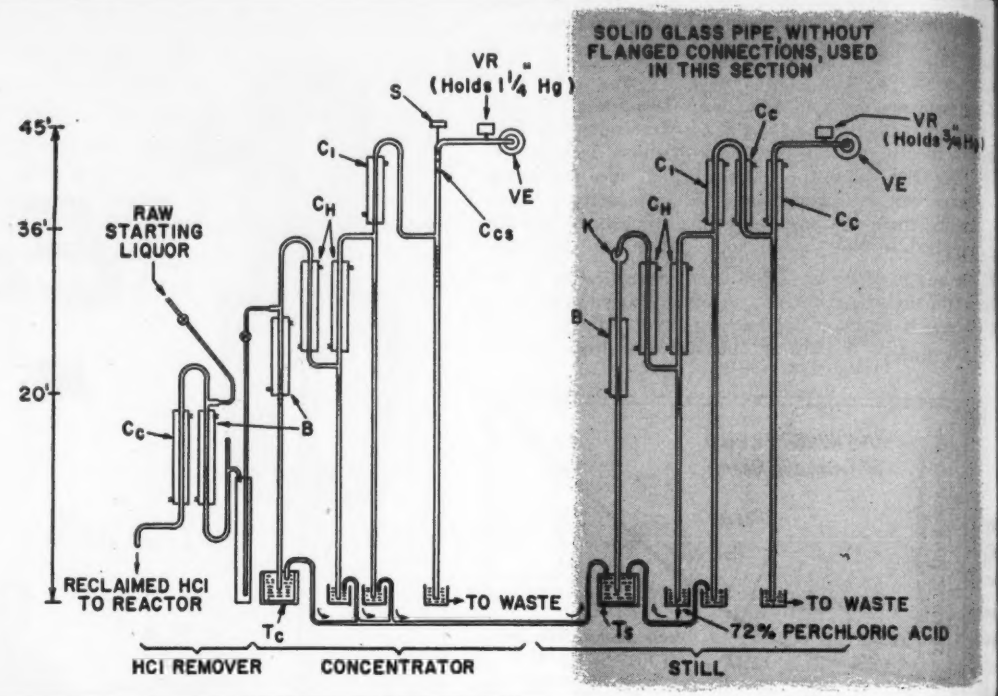
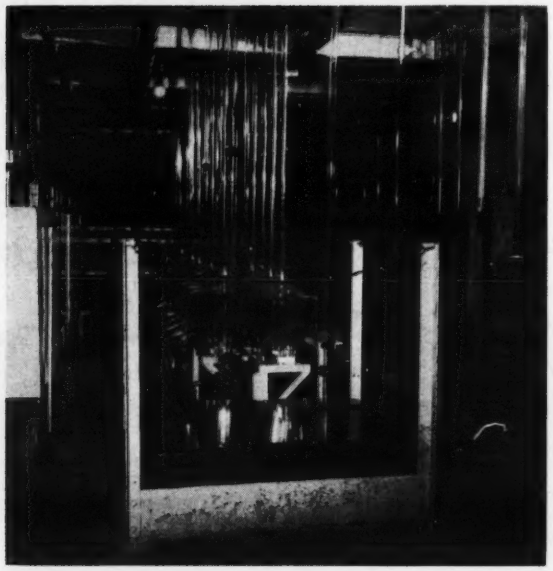
Main part of Oldbury Electro-Chemical's plant for making 70-72% perchloric acid from sodium perchlorate cell liquor. All parts contacting the material in process are Pyrex glass. This part of the process is continuous.

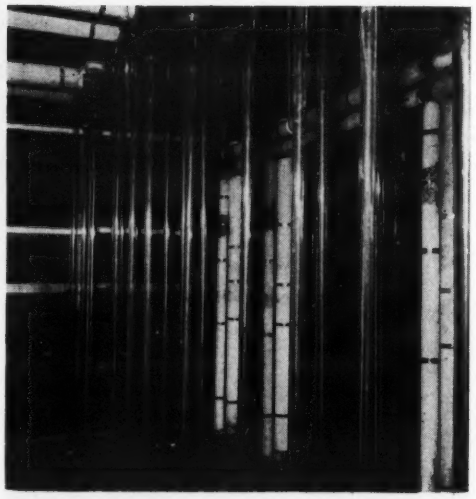
Perchloric acid is formed by reacting the cell liquor with an excess of HCl. By-product NaCl is filtered out. Excess HCl is boiled from liquors in "HCl removers," and is returned to the reaction tanks. Semi-purified perchloric acid is then fed to 3" glass "concentrators" where residual HCl and some water is removed by distillation under vacuum.

Concentrated, impure acid is then distilled under vacuum in the final "still" section, and is condensed as pure, approx 71% perchloric acid.





Pure 70-72% perchloric acid from process is collected in these bottles which overflow through a manifold into covered ceramicware tank shown in foreground



These glass lines are part of finishing still section. No gaskets can be used in this section, and all joints are made by sealing lengths of glass, and fittings, to each other

"Carloads per Week" of 70–72% Perc Being Made in Oldbury's All-g

One section of accident-free installation assembled without gaskets by sealing and annealing lines on the spot

PROBLEM: When Oldbury Electro-Chemical Co., Niagara Falls, N. Y., was planning its commerical plant for the production of 70-72% perchloric acid from sodium perchlorate cell liquors, materials of construction had to be chosen with care. The corrosive nature of the $HClO_4$ itself and its mixtures with HCl throughout the process narrowed the choice down to tantalum, ceramicware, or Pyrex type glass. The glass was chosen because of its favorable price and relative ease of fabrication.

—Cold condenser (jacket supplied with 35-40°F water)

—Cold condenser using direct spray

—Hot condenser (jacket supplied with 195-200°F water)

—Intermediate condenser (jacket supplied with 70-75°F water)

—Boiler (jacket supplied with 50 psi steam)

and T_6—Glazed ceramicware tanks; actually one and the same at Oldbury. Precipitated $NaClO_4$ is periodically filtered out on ceramic filter equipped with glass cloth

—Water spray source

R—Vacuum regulator

E—Hard rubber water ejectors for vacuum

—Kjeldahl head (to separate entrainment)

Typical Liquor Analyses Throughout Perchloric Acid Process

	Raw Starting Liquor	Leveling HCL Remover	Leaving Concentrator	Final Product
Specific gravity	1.350	1.395	1.58	1.678
$HClO_4$, per cent	32.0	39.4	57.0	71.0
HCl, per cent	8.1	0.86	0.04	<0.1 ppm
Non-volatile, per cent	5.9	7.24	10.5*	<50 ppm
Water (by difference), %	54.0	52.5	32.46	approx. 29

*Including $NaClO_4$.

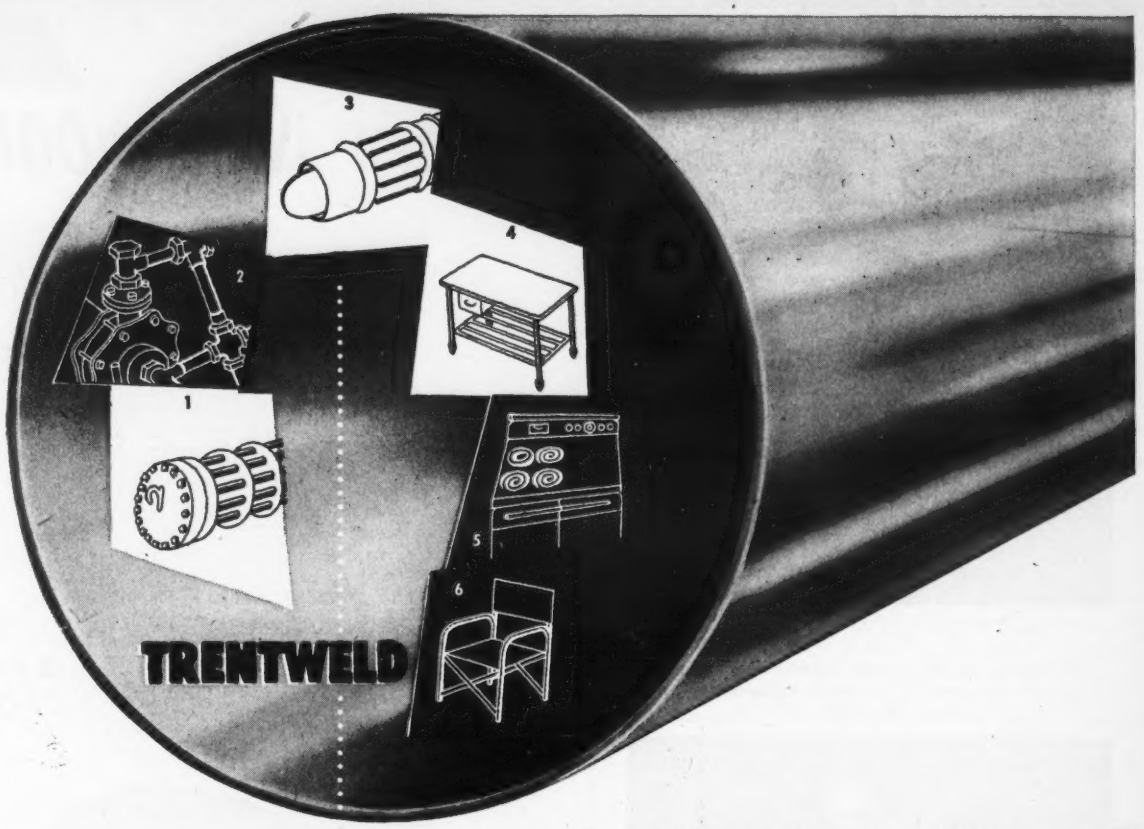
2% Perchloric Acid ry's All-glass Plant

No sooner had that decision been made when it became evident that there was no suitable gasket material made which would withstand the high-strength $HClO_4$ in the still section.

Solution: The still section is made with blown joints throughout. In the course of erection of this unit, Oldbury developed techniques in joining and sealing 1" and 2" glass (3" glass is used elsewhere). Standard straight lengths, bends and fittings were purchased, but all work of sealing was done on the job. A home-made apparatus for annealing pipe in place was even developed by Oldbury technical people. It is essentially a small, hinged, tubular electric furnace which can be clamped around the pipeline.

The initial plant, consisting of four HCl removers, four concentrators, and eight finishing stills, was completed in 1943. Additions have been made since to that plant, so that capacity has been more

(*Continued on next page*)



...solves toughest tubing problems

1 PRESSURE TUBING

2 SANITARY TUBING

3 AIRCRAFT TUBING

4 MECHANICAL TUBING

5 HEAT RESISTANT TUBING

6 ORNAMENTAL TUBING

From the scorching heat of jets and the processes of atomic energy to the delicate handling of pharmaceuticals and dairy products, TRENTWELD *welded* stainless steel tubing has proved its ability to outperform other types.

TRENTWELD tubing is produced by tube mill specialists from accurately rolled sheet and strip. The exclusive welding process employed provides an exceptionally sound weld—just as strong and corrosion resistant as the body of the tube itself. No filler rod is used, and even by casual observation the superiority of TRENTWELD is evident.

These advantages account for the popularity of TRENTWELD stainless tubing for many different applications . . . aircraft, beverage, chemical, dairy, food processing, pulp and paper, and household articles. For each of these uses and many others there are many grades, gauges and finishes of TRENTWELD. And TRENTWELD is available in a wide range of sizes from ⅛" to 40" O.D. Write today, and let us help you solve your tubing problem.

TRENTWELD

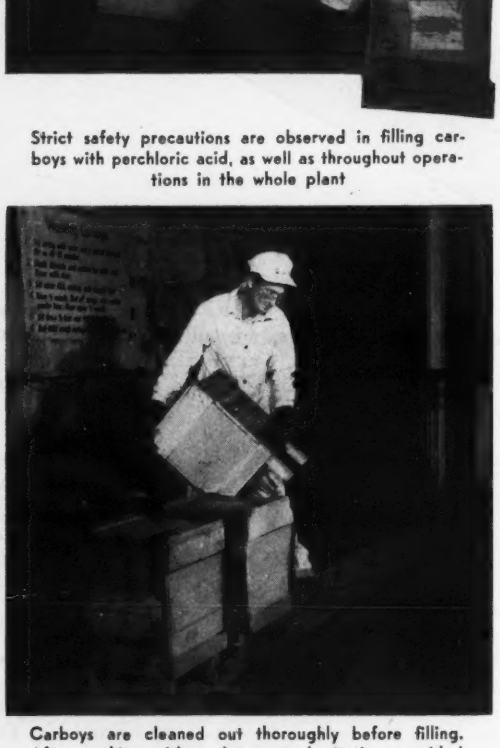
STAINLESS STEEL TUBING

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)

When inquiring check CP 1628 on handy form, pgs. 2-3

(*Continued from preceding page*)

Strict safety precautions are observed in filling carboys with perchloric acid, as well as throughout operations in the whole plant



Carboys are cleaned out thoroughly before filling. After washing with a detergent (agitation provided by air from rubber tubes connected to line against wall in background), carboys are emptied and put upside down above spray arrangements as shown. These jets—perforated along their length—rinse out the carboys thoroughly

than doubled, and carload quantities of 70-72% perchloric acid can be turned out every week.

Oldbury's glass-working technique improved in step with the expansion. A maintenance man can now learn how to put in a satisfactory joint after several days of training.

Results: The company has found that glass pipe is highly satisfactory for the strong acidic conditions of its plant. After once gaining familiarity

Where CONTINUOUS FLOW AN AXI

Zurn LPD Duplex Gate-Type Strainers in common with other types provide continuous flow of liquids. These Strainers can be used for all liquids. Zurn Engineered LPD Strainers are designed to provide the answer to costly shut downs.

ZURN

DUPLEX GATE-TYPE

LPD STRAINERS

Free Floating Valve Disk, easily removed through the valve access cover, insures against binding of valve operating mechanism.

Hinged Cover with "C" Washer Closure and Multiple Basket design facilitates cleaning; permits one man operation.

Zurn LPD Duplex Gate-Type Strainers can be used for all fluids. They permit high rates of flow with remarkably low pressure drop and immeasurably improve the handling of fluids.

Large open area ratio (6 to 1) lengthens cleaning cycle relative to conventional style 2½ or 3½ to 1 open area ratio strainers.

Angle Basket design permits straight-through flow, minimizes pressure drop.

Operating Screw cannot be damaged by corrosion or foreign particles in the liquid on the inside or by physical damage on the outside of the strainer.

...AND MAXIMUM CAPACITY are required, use

ZURN

DUPLEX GATE-TYPE

Low Pressure Drop STRAINERS

Design improved for placement of Multiple Catch-Baskets. *This permits straight-through flow which minimizes pressure drop.* Angle Basket design insures complete retention of strained particles when basket is being removed for cleaning. *One man can complete basket cleaning easily, rapidly and at low cost.* Basic face-to-face and centerline-to-base dimensions are favorable for installation in minimum space.

Like all other Zurn LPD Strainers, Duplex Gate-Type Strainers are held at close tolerances for materials, shapes and dimensions assuring the utmost in strength and safety and continuous operation.

Zurn LPD Strainers are widely used to protect close-tolerance control devices and delicate mechanisms, also to protect product purity. They make continuous production processes possible. Zurn Fluid Handling Engineers are available for consultation on your particular problem. Write or wire direct to factory.

J. A. ZURN MFG. CO.

INDUSTRIAL DIVISION • ERIE, PA., U. S. A.

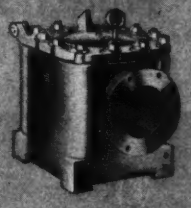
In Canada: Canadian Zurn Engineering Ltd., Montreal 25, P. Q.

There is a ZURN LPD Strainer for every fluid handling purpose

Zurn LPD Duplex Strainer, Plug-Type.

Zurn LPD Sinlox Strainer available in offset and straight-through types.

Zurn LPD "Y" Type Strainer available in any cast material and for high pressures.



Zurn LPD Sinlox Strainer, Multiple Basket Type, available in several metals and for high temperature installations.

Zurn LPD Strainer applications include fluid handling lines for lubricating and fuel oil, and oil during the refining process; a wide range of chemicals produced and used by the various process industries; public utility power plants; power stations; industrial plants; ships and high temperature installations. Zurn Fluid Handling Engineers are available for consultation.

Zurn Engineered Low Pressure Drop Strainers are patented and patents pending.

Copyright 1953

WRITE FOR ZURN LPD STRAINER DATA MANUAL NO. 952

This Manual includes *previously unpublished pressure drop data* and gives useful, factual information on fluid handling.

J. A. ZURN MFG. CO.
Industrial Division, Erie, Pa., U. S. A.

Please send me Zurn LPD Strainer Data Manual No. 952.

Name .....

Position .....

Company .....

Street .....

City and State .....

Please attach coupon to your business letterhead. Dept. CP

When inquiring check CP 1629 on handy form, pgs. 2-3

with glass, the personnel found that it has nothing to fear for production installations. They are entirely at home with it, both in designing and fabricating.

No Lost-time Mishaps

Management is justly proud of its safety record: no lost-time accidents since starting operations about ten years ago, in spite of the hazardous nature of perchloric acid. Since the acid is a strong oxidizing agent when hot, no wood is used in building construction, and no type of oil or lubricant is permitted in the building. Liquids are transferred by blowing with oil-free compressed air, by vacuum, or by gravity.

Operators are furnished with rubber shoes, overalls, and clean underclothing daily. The concentration of acid produced, 70-72%, is near a constant-boiling mixture and is quite stable, but higher concentrations are unstable, even at low temperatures. The plant is designed so that it is impossible to produce an acid stronger than 72%.

If a line breaks in the still or concentrator section, the vacuum in that section is lost and all liquid drops into the ceramicware tanks at the bottom of the barometric legs. An additional precaution is provided by having four vacuum-system taps at the entrance of the building. If something goes wrong, besides a line breaking, these can be opened with a flick of the wrist, destroying the vacuum in the system, thereby causing the liquid to drop into the tanks, as above.

(Glass pipe such as that used here is made by Corning Glass Works, Dept. CP, Corning, N. Y. . . . or for more information check CP 1630 on handy form, pages 2 and 3.)

Resistance to sunlight, salt spray provided by resin in coating

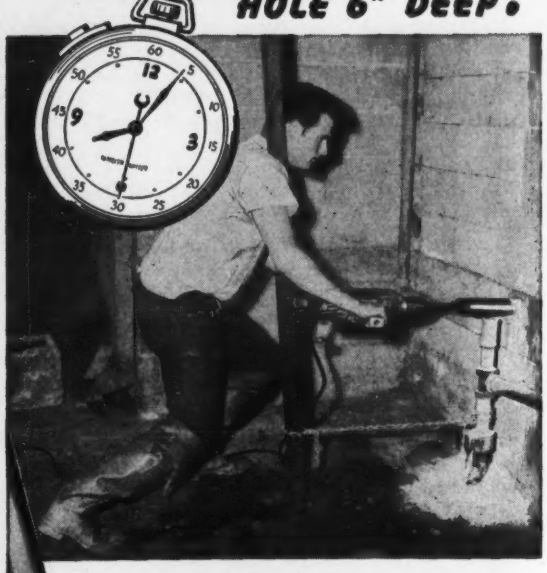
Properties and applications of a polyvinyl butyral resin for primer coatings are described in 10-page booklet. Recently approved as a Type II wash primer by military specification, product has strong resistance to sunlight, water, and salt spray. These properties make the resin particularly well suited as a metal conditioner for ship hulls, aircraft, railway equipment, motor vehicles, and other miscellaneous equipment designed for outdoor use.

Product also is finding extensive use in coating formulations used as can liners, pentrating wood-finishing sealers, and knot sealers for woods.

Production Information Bul 72 is issued by Monsanto Chemical Co., Plastics Division, Dept. CP, 100 Monsanto Ave., Springfield 2, Mass. When inquiring specify CP 1631 on handy form, pages 2 and 3.

PROCESSING & ENGINEERING
DATA Section on
pages 200, 202, 204, 206

4½ MINUTES TO DRILL THIS HOLE 6" DEEP!



TILDEN ROTARY KONKRETE KORE DRILLS

cut reinforcing rods in concrete!

Under the actual on-the-job conditions shown above, a Tilden 2½" diameter Rotary Konkrete Kore Drill cut through 6" of concrete—including crossed steel reinforcing rods—*in just 4½ minutes!* The straight, clean, ready-to-use holes permitted immediate running of 2" pipe. You consistently get 5 to 7 times more holes without resharpening with a Tilden Drill—and free factory sharpening is still available on sizes from 3/16" to 4" diameters. Tilden Drills can be used with ordinary electric or rotary air motors. Interchangeable shanks are available for any depth hole.

Find out about this revolutionary drill TODAY! Consult our Engineering Department without obligation, on your drilling problems.

Sold Through Distributors Everywhere

U. S. Patent No. Re. 23539

WRITE TODAY for free illustrated catalog. Please describe your drilling problem in detail.

TILDEN TOOL MANUFACTURING COMPANY
221 Los Molinos, San Clemente, Calif.

Gentlemen: Please send me without obligation, complete information on the Rotary Konkrete Kore Drill.

Name_____

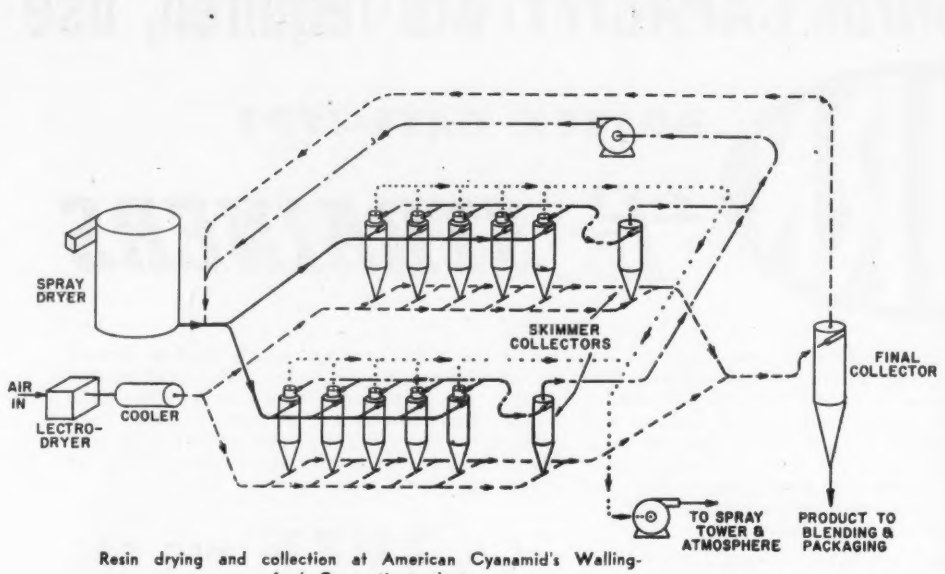
Title_____

Company_____

Address_____

When inquiring check CP 1632 on handy form, pgs. 2-3

w solutions
ocessing problems



Resin drying and collection at American Cyanamid's Wallingford, Connecticut, plant

Quick Cooling and Dry-air Conveying Protect Spray-dried Resins' Quality

Bottom of primary collectors, and ducts of air conveying system which carries dried resin away to final collector from which product is blended and packaged

Cool air with 40 gr/cu ft moisture carries dried product from bottom of water-jacketed cyclone collectors

PROBLEM: Urea-formaldehyde and melamine-formaldehyde resins are spray dried at the Wallingford, Conn., plant of American Cyanamid Company. Dried material leaves the spray dryer chamber with the hot air, and is collected in a cyclone collector system.

Some of these materials are at a moisture content and

View of top of primary collectors and outlet ducts. Skimmer collector inlet ducts are in top foreground

temperature where they would react in the collection system if nothing were done to prevent it. These reactions, besides lowering product quality, would often result in products which could clog up the equipment.

Another consideration which made it impossible to use ordinary means of collection was the necessity of keeping moisture from the products. Even the amount of moisture in the atmosphere would be enough to contaminate the products seriously.

Solution: The system installed to overcome these difficulties is depicted in the accompanying drawing. All collectors except the final one are water-jacketed at the bottom for the cooling effect given the dried product and the hot gases carrying it over from the dryer.

As shown, flow from the dryer splits into two streams. The duct for each stream has five cyclone collectors connected into it. Each of these has a "skimming" or "shaving" arrangement to increase overall collection efficiency. Air and product skimmed off leave the collector by duct, join the material skimmed from the other four collectors in a bigger duct, and all goes through a so-called "skimmer" cyclone collector. Thus, there are a total of twelve cyclone collectors in the primary system, including the two skimmer collectors.

Exhaust from the cyclone and skimmer cyclones is sent through a spray tower where water removes the dust remaining in the air stream. No attempt is made to recover any of the material from the water leaving the tower.

Conveying with Cool, Dry Air

Dried product is taken from the bottom of the ten collectors and two skimmer collectors by dry and cool air. Air dryers are activated alumina type, made by Pittsburgh Lectrodryer Corporation. The alumina is regenerated by heating with built-in steam coils to drive off the adsorbed moisture.

All the product is brought together into one duct which takes it to the final product collector, from which it is taken away to blending and packaging operations. Exhaust from this collector is sent to the hot air and product stream going from the dryer to the primary collectors. It contains a small amount of product.

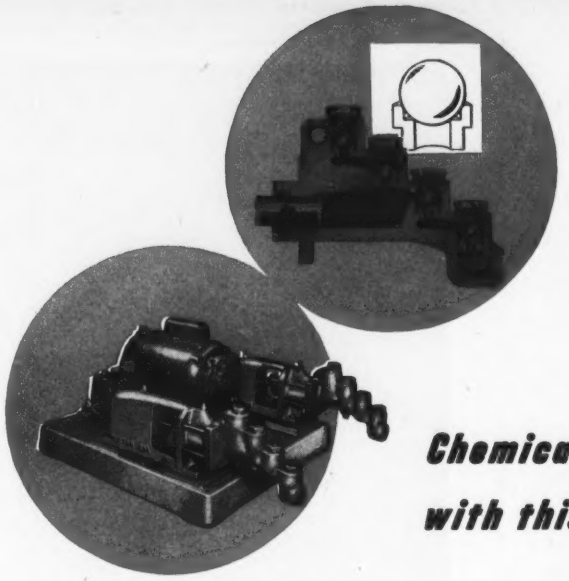
Results: Satisfactory operation since installation about 10 years ago. Product has been consistently of high quality and proper moisture content.

(The editors thank the engineering staff of the Wallingford, Connecticut, plant of American Cyanamid Company, for help in getting the facts for this story.)

A company name and address . . .

at the end of each editorial article makes it easy for you to follow-up on process-improving ideas you read about in these columns . . . saves you time. Write direct or use the handy Reader Service slip.

THE EDITORS



Basic design simplicity of the *exclusive* Milton Roy liquid end step-valve assures high and reproducible volumetric efficiency. The self-cleaning *double* ball-checks seat positively, dislodge any trapped particles by spinning action, are snap-acting.

Chemical Treatment Costs Drop with this Milton Roy Pump

CONTROLLED VOLUME PUMPING

INSTRUMENTATION

PROCESS CONTROL SYSTEMS

BLENDING AND FORMULATING

ON THE JOB in a well-known chemical processing plant, this Milton Roy Motor-Driven Controlled Volume Pump meters the flow of concentrated sulphuric acid to the deoiling step in an ore flotation process. The accurate control of acid addition results in minimum usage of concentrated sulphuric acid and subsequent caustic, thereby lowering treatment costs.

This is a typical example of how Milton Roy Pumps effect dollar savings in hundreds of applications throughout industry. As motor-driven or air-powered units, or as components of automatic systems, their accuracy and long service life bring measurable returns to users. In *boiler feed water treatment,* for example, they are used in all forms of handling internal or external treating chemicals; in *petroleum processing,* for crude desalting and gasoline treating; in *textile manufacturing,* for acid, alkali or bleach baths; in *instrumentation,* to satisfy control requirements.

These are rugged, dependable pumps. They meter practically any liquid—abrasive slurries, solids in suspension, solvents—in capacities from 3 milliliters per *hour* to 45 gallons per *minute,* against pressures up to 25,000 pounds per square inch with instrument accuracy. We invite your inquiries.

Bulletin No. 553 tells you how you can profitably use Milton Roy Motor-Driven Controlled Volume Pumps in your business. Write for your free copy.

Engineering Representatives in the United States, Canada, Mexico, Europe, Asia, South America and Africa.

Milton Roy COMPANY

Manufacturing Engineers • [illegible] LANE • PHILA. 18, PA.

CONTROLLED VOLUME PUMPS AND AUTOMATIC CHEMICAL FEED SYSTEMS

When inquiring check CP 1633 on handy form, pgs. 2-3

Revised installation for gluing plastic handles into sponges ups production 6-fold . . .

controlled volume pump meters "just-right" shot of glue into slit in cellulose sponge

Problem: As demand for its "Dish Mop" (2½ by 3 by 1" cellulose sponge with polystyrene handle) increased, O-Cel-O, Division of General Mills, Inc., found that its method of inserting and gluing-in the handle would have to be changed. With the existing, essentially manual operation, the company considered itself lucky to turn out 1800 completed mops per 8-hr day . . . but anticipated demand was five or six times that.

Actually, the operation was badly in need of revision anyway. The glue (in a solvent) was injected into the slit sponge by an oil can operated by a foot pedal. Obviously, close control over the amount of glue added could not be had with such an arrangement. As a result, an over-supply weakened the mop because the excess solvent attacked the handle, and an under-supply weakened it because there wasn't enough adhesion.

In addition, maintenance of the system was extremely high, and much care had to be taken to exhaust solvent fumes coming from the open set-up.

Solution: O-Cel-O engineers developed a semi-automatic system through the use of an "ai ROY metric" controlled volume pump. The sponges drop individually from a hopper into spring-tension holders arranged around the circumference

Cellulose sponge "Dish Mops" come rolling off assembly line at O-Cel-O

of an indexed circular table. The table revolves a certain distance at a time, under the control of a timing arrangement.

As each holder stops in front of the "knife station," a pneumatic cylinder shoots the knife into the sponge, and a metered amount of glue is injected into the slit through the hollow blade. Handles are then put into the glue-holding slit automatically, by a special machine.

THESE TEN-YEAR-OLD PUMPS for circulating organic acids are built entirely of Stainless Steel. In spite of their long service, they are still in very good condition.

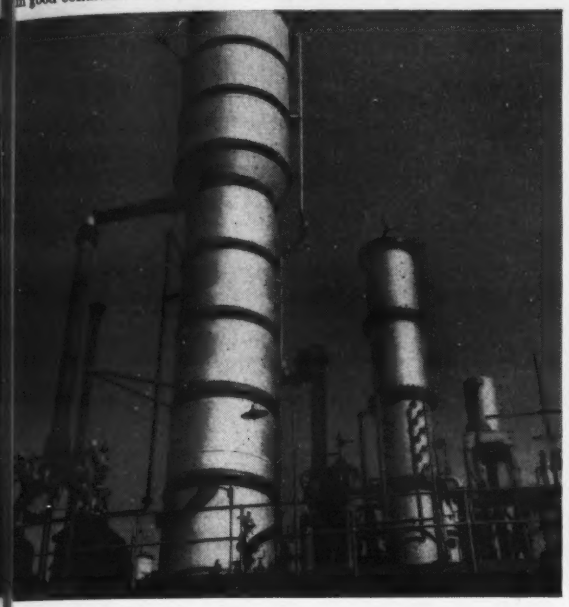
STAINLESS STEEL also resists corrosion in the column and kettle of this batch still kettle for distillation of esters. The equipment, still in good condition, has been in use three years.

STAINLESS STEEL STRIPPING MILL is used for removing water from organic liquids. It is four years old and still ready for more service.

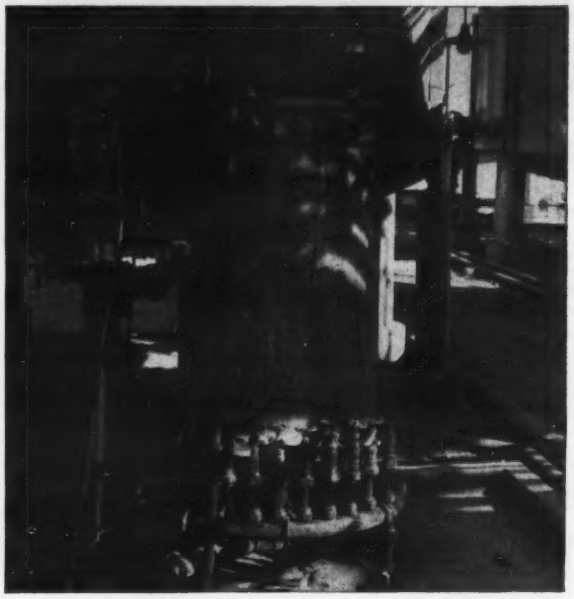
For corrosion resistance in pe

ALL PARTS of this automatic bagging machine in contact with hot resin are Stainless Steel. Stainless is used to prevent contamination of vinyl resin.

VESSEL AND ALL INTERNALS of this still for distillation of acetic acid are Stainless Steel for resistance to corrosion. The Stainless is in good condition after three to four years' service.



OLIVER LEAF FILTER, used to remove salt from an organic base, has shell, leaves and valves of Stainless Steel. In service between four and five years, it is in excellent condition.



in petro-chemical operations

THIS MAJOR TEXAS PRODUCER SELECTS

STAINLESS STEEL

● At its big Gulf Coast operation, this producer of petro-chemicals makes extensive use of Stainless Steel in many types of processing equipment.

In some of these applications, Stainless Steel's resistance to corrosion led to its selection. In others, the absence of product contamination that Stainless assures was the determining factor.

These are only two of the important benefits of Stainless Steel in chemical processing equipment. Others include ease of cleaning, elimination of downtime for replacement, excellent performance in certain high temperature operations or when high pressures are involved.

It will pay you to investigate the use of Stainless Steel in your plant wherever you need these benefits. And if you want the finest performance, be sure you use perfected, service-tested U·S·S Stainless Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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U·S·S STAINLESS STEEL

USS

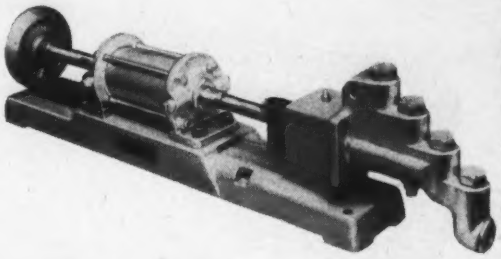
SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

3-1087

UNITED STATES STEEL

When inquiring check CP 1634 on handy form, pgs. 2-3

just the right amount of glue into each sponge. It takes the glue from a closed drum and pumps The air-powered controlled volume pump injects



Controlled volume pump (shown in photo above) injects proper amount of glue into slit made for holding plastic handle

it against a pressure of 35 psi, at a rate of 0.8 gph. Blue African asbestos packing is used.

Results: Using the same labor, O-Cel-O is now able to complete better than 10,000 mops in an 8-hr day. The installation has been in since March 1952, and has required little maintenance: 75% less than the old method. Fumes are no longer a problem because of the closed system.

(Controlled volume pump was supplied by Milton Roy Company, Dept. CP, 1300 E. Mermaid Lane, Chestnut Hill, Philadelphia 18, Pa. . . . check CP 1635 on handy form, pages 2 and 3.)

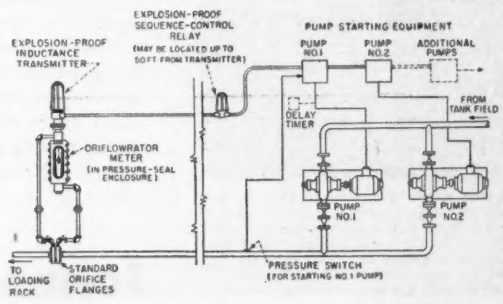
Starts and stops pumps as needed without guesswork . . .

series of pumps are "thrown in" in sequence when delivery rate calls for them

Problem: A common pumping problem is the case where delivery of fluid must be varied over a wide range — high capacity needed for high rates is wasted at low rates. Moreover, running pumps with too little throughput causes heating and vapor lock, in some cases.

Solution: System for starting a series of pumps in sequence maintains a continuous balance between pumping capacity and flow rate. Known as an Oriflowrator, instrument is a variable-area

(*Continued on next page*)



Illustrates how series of pumps are used as needed

(*Continued from preceding page*)

meter employing an inductance transmitter which switches the correct number of pumps for maintaining flow. This instrument meters flow of a by-pass around the main line. Output is linear with fluid rate.

As float rises in tube, a nickel alloy tube moves up into transmitter. Transmitter contains a number of flat coils spaced vertically. As nickel alloy tube moves through the center of each coil, it changes coil's impedance, and through a Thyraton circuit, starts each successive pump motor. Since meter is calibrated to read main line flow directly, coils may be positioned to throw in pumps as needed.

Where containers are being filled, an additional feature is used to control very low flow rates. A time delay switch, connected in series with the first pump, keeps that pump operating for an additional minute (or other interval) after flow has been stopped. Furthermore, a pressure switch in system constantly senses drop in pressure due to leakage through back pressure valves. When needed, it switches on first pump to maintain constant head despite prolonged idle periods.

Results: Already in use in several refineries for filling tanks, tank cars, trucks, and drums, system has proved itself to be efficient and safe. For these installations, inductance transmitter and control relay were furnished in explosion-proof housings. Flowmeter was housed in a pressure-sealed enclosuure so that in event of damage to the glass metering tube, fluid is confined within housing and will not create a fire hazard.

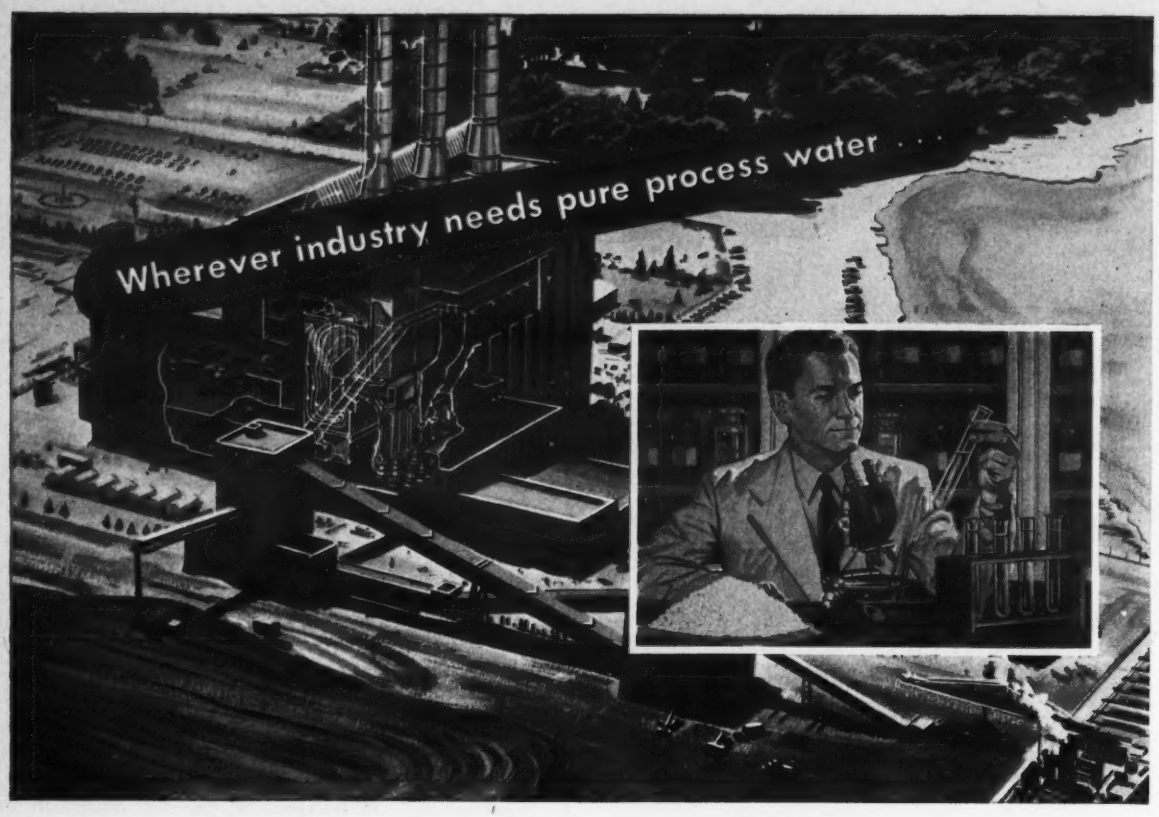
(Oriflowrator Pump Sequencing System is a development of Fischer & Porter Co., Dept. CP, Hatboro, Pa. . . . or for more information check CP 1637 on handy form, pages 2 and 3.)

Heat of chlorination dissipated in Pyrex cascade cooler . . .

system saves 8 to 10 man-hours on every 750-gal batch of sodium hypochlorite solution

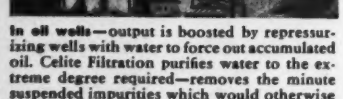
The John Wiley Jones Company, manufacturer of Sunny Sol household bleach and other chemical specialties, is using a Pyrex pipe cascade cooler for dissipating heat of chlorination originating in production of 15% sodium hypochlorite solution. The installation saves 8 to 10 man-hours on each 750-gallon batch, as compared to previous cooling method, in which candle coolers were used in vats of the solution.

In the chlorination, chlorine is absorbed into a 76% solution of sodium hydroxide as fast as possible, but while keeping the temperature of the solution below 85°F. Since the reaction develops about 67,000 Btu per 100 gallons, about 500,000 Btu must be dissipated in the cascade cooler during processing of a 750-gallon batch. Average time for a batch chlorination is approximately 3½ hours. The cascade cooler was assembled of 18 standard



CELITE FILTRATION controls water purity—
removes *all* suspended solids

In oil wells—output is boosted by repressurizing wells with water to force out accumulated oil. Celite Filtration purifies water to the extreme degree required—removes the minute suspended impurities which would otherwise clog the microscopic pores of sandstone.



In paper plants—Celite Filtration is used to purify the large quantities of water used in paper formation. Waste water may be filtered for reuse by the same process. Celite filter cakes can withstand many times the pressure of an ordinary filter bed. No pH control is necessary with Celite. *T.M. Reg. U.S. Pat. Off.

CELITE* FILTRATION provides the *right degree* of purity that you require for industrial process water. It removes sediment which may cause costly downtime or damage to expensive plant equipment. And if your application requires greater purity, Celite removes even such fine suspended solids as amoebae and algae, many of which cannot be filtered out by other methods. Moreover, fast, economical rates of flow can be maintained with Celite Filtration

This selectivity in degree of water purity is made possible because Celite comes in nine standard grades . . . each designed to filter out impurities of specific size and type. Carefully processed from the purest deposits of diatomaceous earth, Celite always has utmost uniformity of product. Whenever you reorder, you are assured of the same accurately graded powder.

Celite Filtration offers many other advantages, too. Important space savings are achieved in the installation, longer filtration cycles are obtained, and less backwash water is required for cleaning the filters than with ordinary systems.

Celite Filtration provides pure process water for boiler make-up, heat exchangers, circulating water for towers . . . and many other industrial uses. It will pay you to investigate the advantages of Celite for your particular application. To have a Celite engineer study your problem and offer recommendations, simply write Johns-Manville, Box 60, New York 16, N.Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

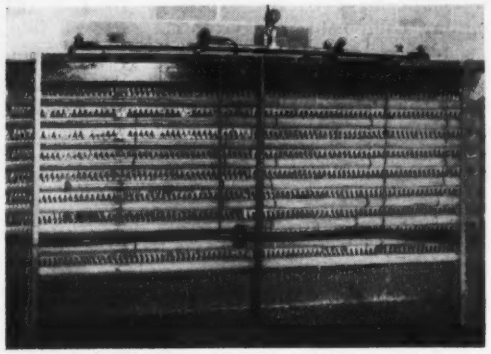
JOHNS-MANVILLE JM PRODUCTS

Johns-Manville CELITE FILTER AIDS

When inquiring check CP 1636 on handy form, pgs. 2-3

10′ lengths of 2″ Pyrex thin-wall heat exchanger pipe, arranged in two banks, with standard Pyrex U-bends connecting the straight lengths. Rubber gaskets were used throughout.

Cooling water is pumped from a 200′ well, and has a year 'round constant temperature of 55 plus-or-minus 3°F. The water is pumped into a trough



Pyrex cascade cooler removing heat developed while chlorinating sodium hydroxide solution

above the cooler, and flows down over the banks of Pyrex pipe at 10 gpm. It is distributed evenly over the outside pipe surfaces by serrated fins.

Solution being cooled and chlorinated is recirculated through the cooler pipe at 35 gpm, under a pressure of about 45 psi.

Besides corrosion resistance, the cooler has the additional advantage of transparency for visual observation of flow and quick detection of air-locks. Cooler is protected by a heavy screen, portions of which slide back out of the way.

(Pyrex coolers are made by Corning Glass Works, Dept. CP, Corning, New York . . . or reader may secure more information by checking CP 1638 on convenient Reader Service slip between pages two and three.)

Water, temps to 650°F will not affect magnetic separator

Four-page, two-color bulletin describes permanent non-electric plate magnet separators which are not affected by water or temperature up to 650°F. Separators are capable of trapping and holding tramp iron in material flows up to 2″ in depth. Magnets are expressly designed for installation in wood spouts, chutes, hoppers, feed tables, and for suspended application above slow-moving conveyor lines.

Units are built in a range of sizes from 4″ to 24″ in width, or can be made for any width installation.

Bul B-603 is issued by Eriez Manufacturing Co., Department CP, 1945 Grove Dr., Erie, Pennsylvania. When inquiring specify CP 1639 on convenient Reader Service slip between pages two and three.

more than 50 years of experience in designing and building dryers for industry . . .

Louisville dryers

used throughout the world for great efficiency with low maintenance

LOUISVILLE DRYING MACHINERY UNIT

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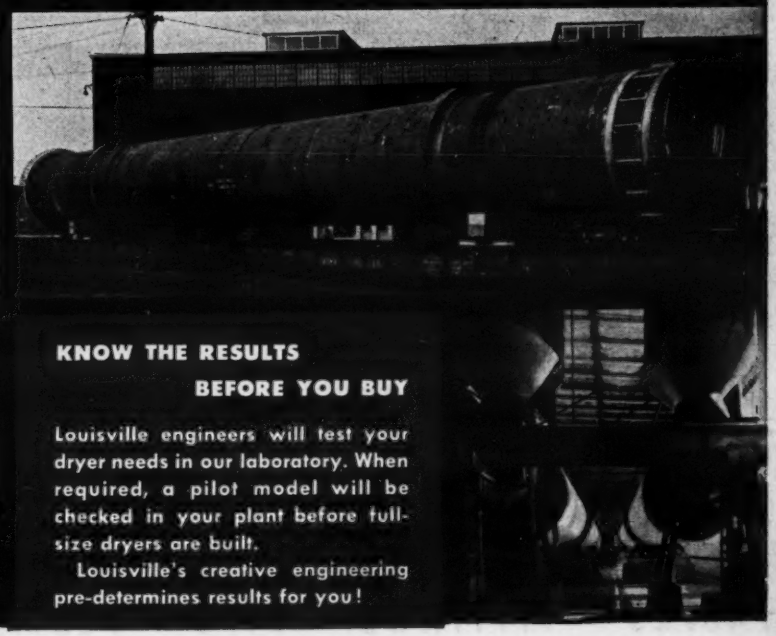
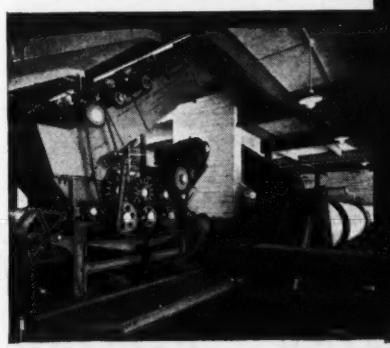
TRADE MARK





KNOW THE RESULTS BEFORE YOU BUY

Louisville engineers will test your dryer needs in our laboratory. When required, a pilot model will be checked in your plant before full-size dryers are built.

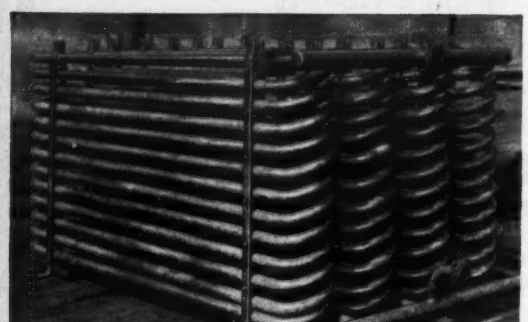
Louisville's creative engineering pre-determines results for you!

When inquiring check CP 1640 on handy form, pgs. 2-3

IN 5 MODERN FABRICATING SHOPS

CRANE

builds pipe coils to DESIGN perfection



2-in. ammonia cooling coils with welded headers and ammonia flanges.

You get the results you planned for in pipe coils built by Crane. And right along with this close adherence to specification goes a greater dependability that enhances your design.

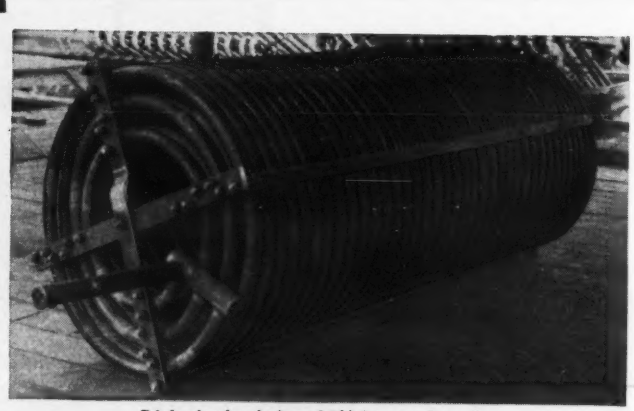
Although seamless carbon steel pipe is most popular, Crane has the experience—and the equipment to produce pipe coils in wrought iron, copper, brass, nickel, aluminum, 18-8 of various types, and miscellaneous alloys. At your service are the finest facilities for heat-treating, stress-relieving and testing of all kinds. Crane can also supply those necessary piping accessories to give your design the added value of consistent quality throughout.

There's further information on this important Crane service in your Crane No. 53 Catalog—and in the 48-page Pipe Coil Handbook, offered below.

FREE 48-PAGE PIPE COIL HANDBOOK

Gives Valuable Design and Specification Data

Dimensions, materials, end connections, pipe data, helpful engineering information—you'll find it all in this factual, easy-to-read handbook, free to pipe coil designers and users. Drop a card to Crane at the address below for your copy (Circular 318).



Triple circular design of 1½-in. seamless pipe.

CRANE CO.

General Offices:
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VALVES • FITTINGS • PIPE • PLUMBING • HEATING

When inquiring check CP 1641 on handy form, pgs. 2-3

Magnetic tramp iron removal saves $4200 per year . . .

not to mention what it would cost to fix damaged fertilizer milling equipment

Problem: Dried fertilizer processed by Fertl-Soil Company in Rahway, N. J., contains quite a bit of stray metal pieces (about 25 lb per ton of raw material). This tramp iron would cause serious damage to the expensive grinding and milling equipment if it were not removed from the fertilizer before the material reached the units.

Solution: The iron is removed by means of a non-electric magnetic pulley, as shown in the photograph. The fertilizer, basically cow manure, is dried in a revolving cylindrical dryer, and then drops onto the belt conveyor which has the magnetic pulley at its head. The fertilizer from which the iron has been removed falls into the feed hopper of the grinding mill. Tramp iron, however, is held firm until carried out of the magnetic field of the pulley and beyond a divider where it falls off the belt and onto a chute which leads it to a container.

Fertilizer drops into mill for grinding, while ferrous contamination passes onto chute at right

Results: Prevention of machinery damage saves the company about $1000, elimination of shutdowns saves about $3000 per year, and man-hours saved averages $1200 a year.

(Alnico V magnetic pulleys are made by Eriez Manufacturing Company, Dept. CP, Erie, Pa. . . . or for more information check CP 1642 on handy form, pages 2 and 3.)

Purity of dyestuffs protected by dustless floors . . .

concrete, installed by absorption control process, stands up under four-ton loads

Problem: At the new Ciba States Ltd. vat dyestuffs plant in Toms River, N. J., a flooring was needed that wouldn't bring about contamination of the product by dust during packaging and storage. In addition, the floor had to be able to withstand loads weighing up to four tons. Packaging was to be done in drums weighing 450 to 500 lb. Two-ton platform conveyors were required to carry four or five drums each. Since the drums had to be stored before shipment, the floor also had to stand up under heavy dead loads.

Solution: Successful experience in their pharmaceutical division at Summit, N. J., where 115,000 sq ft of flooring was installed by the absorp-

tion control process, led plant officials to adopt the same type of floor for the Toms River plant. This process is a method of controlling the water-cement ratio, assuring a dense, durable, and smooth concrete topping. More than 125,000 sq ft of this type of concrete floor was installed in the new plant.

Results: Concrete floors have been found to remain dust-free, safeguarding the purity of the

Interior view of one of the large storage areas illustrates the smooth, dustless finish of floor and the heavy dead loads it is required to carry

product. The floors have also stood up well under the four-ton loads on the platform conveyors as well as the heavy dead loads in the warehouse and storage sections of the Toms River plant. The plant will produce approximately 4,000,000 lb of anthraquinone vat dyes annually and is said to have a potential of many times that amount.

(Concrete flooring, constructed by absorption control process, is produced by Kalman Floor Co., Dept. CP, 110 E. 42nd St., New York, N. Y. . . . or for more information check CP 1643 on handy form, pages 2 and 3.)

Ten times as much chips travel tube 1/4 the diam with less "push" . . .

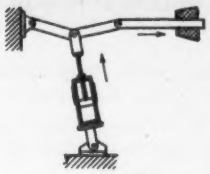
pneumatic conveyor moves 20 tons of wood an hr from mill to cars 1300′ away, with 90 hp

Problem: Only 2 tons of pulp chips per hour could be transferred from mill to box car by conventional low-pressure pneumatic system at the Rutledge Mill of Potlatch Forests, Inc., Coeur d'Alene, Idaho . . . and it took a connected load of 150 hp and a 24″ diameter pipe to move even this amount.

Solution: About a year ago another pneumatic handling system for chips was installed at the Rutledge Mill, but this moves the chips at a much higher stream density. This system, the Conveyair system, consists of a feeder (see drawing) to which is attached one or more separate blowers by flexible tubing, a 6⅝″ OD conveying tubing, and a control system. Chips are conveyed 1300′ with a horizontal lift of approximately 20′.

In this installation a 9″ Conveyair auger type feeder with 15-hp motor is employed. Three

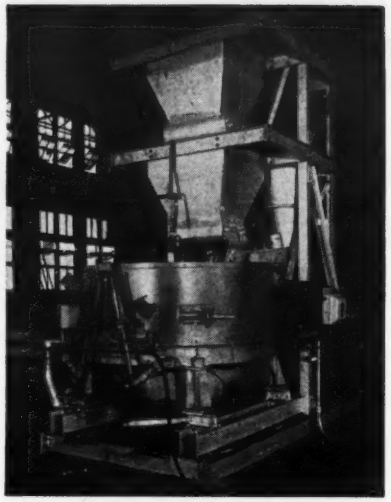
(*Continued on next page*)



Cylinder and toggle.

Hanna® Cylinders

Speed Processing Operations



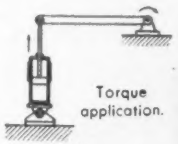
Hanna Air-operated Cylinders supply reliable, controlled power for operation of mixer discharge gates.

CYLINDER POWERED MOVEMENTS SIMPLIFY HANDLING OF MATERIALS

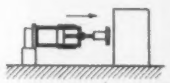
Cylinder Power offers fast, dependable action for process operations requiring controlled movements . . . pushing, pulling, raising, lowering or tilting . . . for opening and closing gates, hoppers, furnace and oven doors . . . for hoists, brakes and presses . . . for materials handling and scores of other operations.

Hanna Cylinders are used to advantage in hundreds of applications of this type to simplify the actuation and control of machines and equipment . . . to replace or reduce manual effort . . . to speed operations.

Ask your Hanna Sales Representative to demonstrate how Cylinder Power and Valve Control can save time, effort and money in your plant.

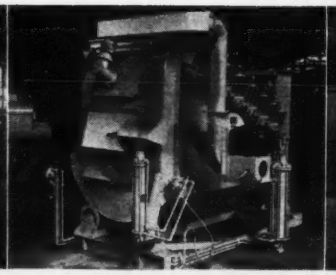


Torque application.



Push, pull, lift, clamp.

Cylinder power is fast and exacting for moving material horizontally or vertically in immersion tanks.



One Hanna Cylinder operates doors and another tilts this furnace as required.

Firebrick rolls in and out of ovens smoothly with the help of economical cylinder power.

Hanna Engineering Works

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1744 Elston Avenue, Chicago 22, Illinois

When inquiring check CP 1644 on handy form, pgs. 2-3

Announcing
SUNOCO PETROCHEMICALS!
Where can you use them?

Product	What it is	Suggested Uses
Sulfonate WS	A low-cost water soluble petroleum sulfonate.	Wetting, air-entraining, foaming, rewetting and ore flotation agent.
Sulfonate OS	A low-cost, highly purified oil soluble petroleum sulfonate.	Detergent and lube oil additives. Surface active agent.
Sunaptic Acids	High mol. wt. naphthenic acids, with unusually low percentage of unsaponifiables.	Driers, emulsifying and flotation agents. Used in preparation of esters, plasticizers and preservatives.
PDO-40	A polymerized, closed-chain hydrocarbon. Dries at room temperature; resists water, alkalies, dilute acids; good color stability; soluble in mineral spirits.	Corrosion resistant surface coatings, metal primers, aluminum bronze vehicle, concrete curing compounds, core oils, and reclaiming agent for rubber.
Propylene Trimer and Tetramer	Commercial grade C_9 and C_{12} mono-olefins.	Synthetic detergents and chemical intermediates.

A Sun representative will gladly discuss these new Sunoco Petrochemicals with you. Or you can get technical data and samples for test purposes. Write SUN OIL COMPANY, Phila. 3, Pa., Dept. CP-6

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SUN OIL COMPANY SUNOCO®
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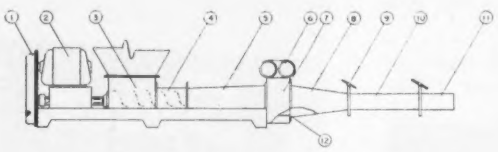
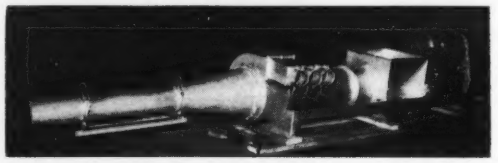
When inquiring check CP 1645 on handy form, pgs. 2-3

blowers, each with 25-hp motor, are incorporated in system. Thus, total connected load is 90 hp.

Referring to drawing, chips are fed into hopper (3) where they are moved by the auger into retainer (5). The retainer is always solidly filled with chips, and the auger moves this "slug" forward. This provides a seal against blow-back. Air is introduced at (6) where flexible tubing from blowers is connected, picks up the chips and carries them into and through the conveying tubing.

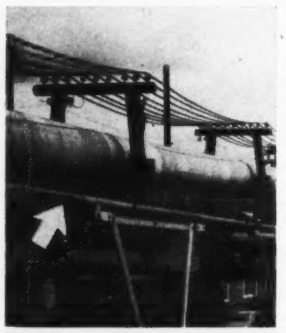


Drawing of auger feeder system shows 1) chain case, 2) feeder motor, 3) feeder hopper, 4) preformer, 5) retainer, 6) air connections, 7) air injector, 8) discharger, 9) disconnect clamp, 10) disconnect section, 11) conveyor tubing, and 12) air orifice



Here is 9" auger feeder unit now in use at the Rutledge Mill of Potlatch Forests, Inc.

Besides overload heater switches on each motor, the system is protected by two pressure switches. One, on the feeder, stops feeder motor when pressure in conveyor tubing rises above normal, and thus prevents damage to the system by overloading. This switch restarts motor when pressure drops again. The second switch stops the whole system when pressure rises high enough to indicate a blockage in the line.



Old low-pressure system (top 24" pipe) carried 2 tons of chips per hour with 150 hp. New system (bottom 6⅝" pipe indicated with arrow) carries 20 tons/hour with 90 hp

The motor-blower units are standard, and mounted on a cast aluminum base. Blower is positive displacement type and is equipped with its own oiling system. Motor is mounted on a plate in order to allow for adjustment of the belt drive.

Results: The new system transports 20 tons of chips per hour — 10 times as much as the old system which required 67% more power. It's

DOW CORNING
ANTIFOAM A

Add a trace of Dow Corning Antifoam A and use the space you've been wasting on foam.

FOR EXAMPLE:

- *Antifoam A permits molasses processor to increase standard load from 18 to 24 tons . . .*
- *Antifoam A enables textile finisher to double color yield on vat dyes . . .*
- *Antifoam A ups vacuum concentration capacity 60% for food processor . . .*

That's what we mean when we say foam's a thief. And you don't have to put up with it any more. Both Dow Corning Antifoam A and the new water-dispersible Antifoam AF Emulsion are effective at very low concentrations against a wide variety of aqueous and non-aqueous foamers. They are odorless, tasteless and harmless physiologically. Dow Corning Antifoam A can be used as received, mixed with one of the foaming ingredients or dispersed in a solvent for industrial application. Antifoam AF Emulsion is equally versatile and easily dispersed in water.

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Dow Corning Corporation
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Please send me data and a free sample of—

☐ Dow Corning Antifoam A or
☐ Dow Corning Antifoam AF Emulsion

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When inquiring check CP 1646 on handy form, pgs. 2-3

interesting to note that total cost of the Conveyair system was less than the cost of the 24" diameter pipe alone in the old system.

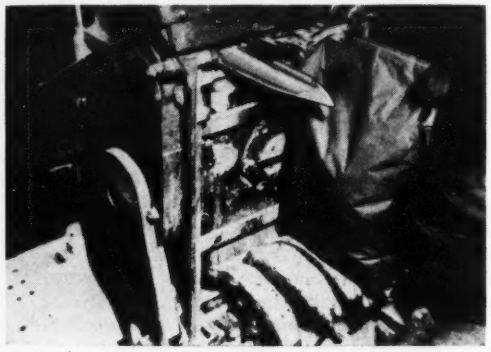
The much smaller pipe used in the Conveyair system simplifies its hanging. Loading of the box cars is easier because the system does not create a dust nuisance; surplus air does not have to be piped back out of the car.

(Pneumatic handling system was supplied by Conveyair (Pulp Division) Limited, Department CP, 8850 Selkirk St., Vancouver 14, B.C.)

Air vent on filling spout assures a full bag of aluminum sulfate

Problem: It was difficult to completely fill heavy export bags with aluminum sulfate in packaging operations at American Cynamid Company's Warners Plant in Linden, N. J. Because of the bag wall thickness, air could not readily escape during the filling operations.

Solution: A packaging machine operator in the alum department, Joseph Hero, came up with the



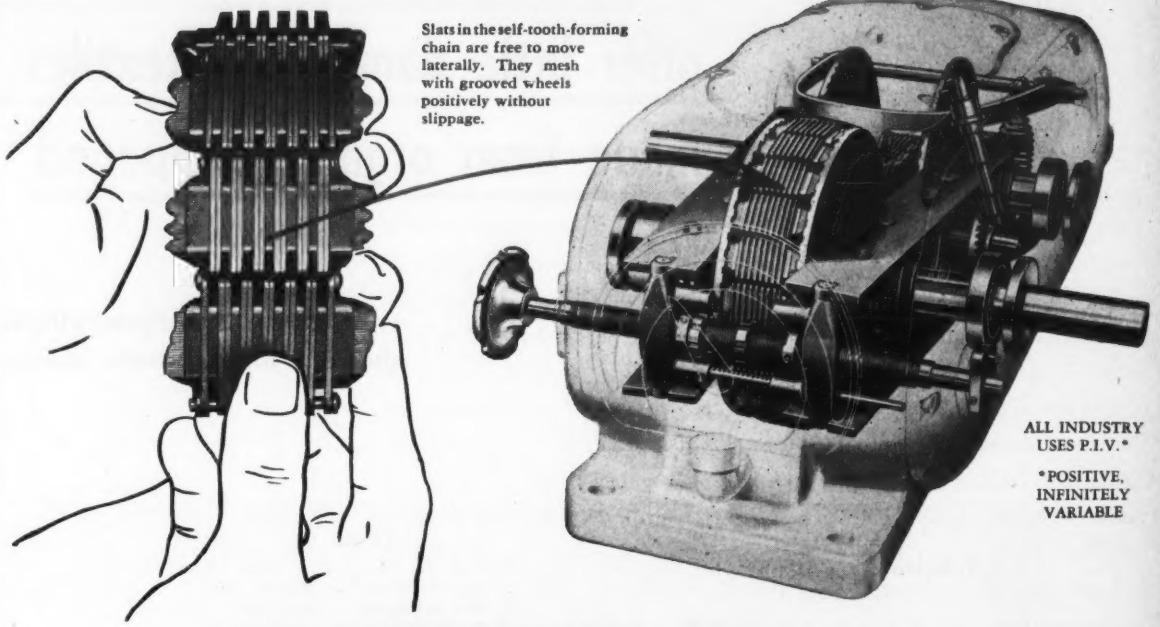
Vented spout (arrow) looks like this in place on bag filling machine (above). Photo below is closeup of spout with vent on top

idea which solved the problem. A piece of small pipe was attached to the top of the spout that pours the alumium sulfate into the bags. The pipe serves as an escape vent for the air in the bag.

Results: *For the Company*: a tighter, stronger package which has less tendency to tear or burst. *For Mr. Hero*: $500 for the idea.

(Information courtesy of American Cyanamid Company, Dept. CP, 30 Rockefeller Plaza, New York 20, New York.)

Completely POSITIVE...
Completely STEPLESS
with an infinite number of speed changes


Slats in the self-tooth-forming chain are free to move laterally. They mesh with grooved wheels positively without slippage.
ALL INDUSTRY USES P.I.V.*
*POSITIVE, INFINITELY VARIABLE

P.I.V. Variable Speed Drive gives you exact selection from maximum to minimum speed

4 of 16 P.I.V types, ½ to 25 hp.—ratios to 6:1
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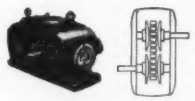
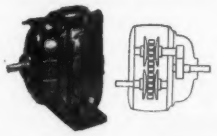
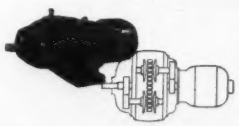


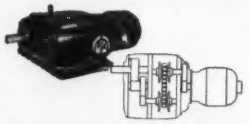
Basic Positive, Infinitely Variable Speed Drive. Compact.



P.I.V. with single reduction input or output helical gears.



Motorized P.I.V. with single reduction input and output helical gears.



Motorized P.I.V. with single reduction input and double reduction output helical gears.

ONLY Link-Belt's P.I.V. Variable Speed Drive uses self-tooth-forming chain to provide positive, stepless speed changing. The chain meshes with grooved wheels, transmits power without wasteful slip.

What's more, Link-Belt's P.I.V. changes speeds accurately under full load, delivers full-rated horsepower to your machines. That's because P.I.V. is not dependent on friction for power transmission. Its all-metal construction is not affected by atmospheric conditions.

Adjustment is easy. You can obtain an infinite number of speeds with manual, electric, pneumatic or hydraulic controls . . . hold the exact speed you need at any setting.

There may be a process in your plant that requires exact, variable speed transmission. If so, it will pay you to contact your nearest Link-Belt office. They'll show you how P.I.V. can increase the flexibility and efficiency of your machines. Send for Catalog No. 2274.

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When inquiring check CP 1647 on handy form, pgs. 2-3

Bleaches have good chlorine retention, offer little damage to textiles when made from organic compound

1,3-Dichloro-5,5-dimethylhydantoin versatile as chemical intermediate, deodorant, sanitizer, etc

(TABLE I)

1,3-Dichloro-5,5-Dimethyl-hydantoin

Form	powder
Color	white
Molecular weight	197.03
Moisture, % (max)	0.5
Active chlorine, % by wt (min)	33.0
Available chlorine, % by wt (min)	66.0
Melting point, °C	130
Density, 20/20°C	1.5
Bulk density, lb/cu ft	30-40
Particle size distribution:	
Through 10 mesh screen	all
Through 10 on 100, %	74
Through 100 on 200, %	17
Through 200 on 325, %	8
Through 325, %	1

Solubility:

Solvent	Temp, °C	gm/100 gm Solvent
Water	25	0.21
Water	60	0.60
Methylene chloride	15	30.0
Chloroform	25	14.0
Carbon tetrachloride	25	1.25
Ethylene dichloride	30	32.0
Trichloroethylene	25	6.8
Perchlorethylene	25	1.0
s-Tetrachloroethane	25	17.0
Pentachloroethane	20	5.0
Benzene	25	9.2
Toluene	25	6.0
o-Dichlorobenzene	20	5.0
Trichlorbenzene	20	5.0

(TABLE II)

(1) Very mild decomposition without flame
(2) Slow decomposition without flame
(3) Slow decomposition with flame
(4) Rapid decomposition without flame
(5) Rapid decomposition with flame
(6) Mild detonation without flame
(7) Mild detonation with flame
(8) Violent detonation without flame
(9) Violent detonation with flame

(TABLE III)

Spontaneous Decomposition Temperatures, °C

	Uncontaminated	1% Contaminant				
		wood	oil	grease	soap	starch
Halane	212(1)	193(1)	215(1)	218(1)	204(1)	186(1)
Calcium hypochlorite	173(2)	173(3)	135(9)	162(3)	170(7)	—
Chloramine T	130(2)	147(4)	130(4)	130(2)	131(4)	153(6)
Trichloromelamine	171(4)	171(4)	140(6)	145(4)	166(6)	176(4)
Sodium perborate	85(1)	—	—	—	—	—
Sodium chlorite	166(7)	—	—	—	—	—

(TABLE IV)

Storage Stability of Common Bleaches, 140°F

Available Chlorine or Oxygen Content

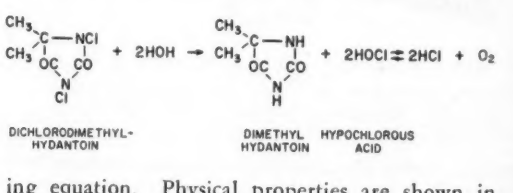
	Initial	3 Weeks	10 Weeks	14 Weeks	% Loss After 14 Weeks
Halane	68.3	67.9	67.6	67.3	1.5
Calcium hypochlorite (70%)	74.9	67.6	53.4	46.8	37.5
Calcium hypochlorite (50%)	47.7	38.6	25.1	18.1	62.1
Calcium peroxide (60%)	12.7	12.1	11.8	11.5	9.4
Hypochlorite-soda mix	33.3	31.9	29.3	30.0	9.9
Sodium borate perhydrate	15.9	15.9	15.6	14.8	6.9

USES: As a laundry bleach, product may be formulated and packaged in convenient powdered form for direct addition to washers.

Other projected utilization includes: chemical intermediate for amino acids, drugs, and insecticides . . . in extreme pressure lubricants . . . for odor removal from such materials as sulfate turpentine . . . as a rubber bonding ingredient . . . for sterilizing ion exchange resin beds, as well as sterilizing paper against fungi and bacteria . . . and also for stripping and shrink-proofing wool.

Features: Advantages from use as a bleach are said to be very slow loss of available chlorine, elimination of explosive hazard, and much lower decrease in tensile strength of fabrics than experienced with conventional bleaches.

Description: Many of the applications of 1,3-dichloro-5,5-dimethylhydantoin — designated as Halane by manufacturer — depend upon the formation of hypochlorous acid with subsequent liberation of oxygen, as shown in the accompany-



ing equation. Physical properties are shown in Table I.

Stability: It is well known that many chlorine-liberating compounds, especially high test calcium hypchlorite, are subject to explosions. Results of

a study of the thermal stability of several oxygen or chlorine liberating compounds are shown on opposite page.

All of the products were uniformly heated until decomposition occurred spontaneously. Nature of the decomposition was classified as shown in Table II.

As chlorine-liberating compounds may become contaminated during storage, the decomposition temperature for these compounds with various contaminants was also studied. These studies indicate that dichlorodimethylhydantoin is essentially free from the explosion hazard. Results similar to those on spontaneous decomposition were obtained when a hot wire representing local overheating was placed in each sample for 2 seconds . . . see Table III.

As a further indication of the stability of Halane in storage, data on the available chlorine or oxygen content of common bleaches stored at 140°F are shown in Table IV.

Toxicity data: Although extensive toxicity data are not yet available, preliminary tests show that 50% pastes cause no skin dermatosis. In addition, plant workers have handled Halane without safety equipment and had no difficulty except in case of specific allergies. At least until further toxicity information is made available, the use of normal protective equipment such as respirators is recommended.

Corrosion: In dry form, Halane is essentially non-corrosive. In the presence of moisture, however, including the moisture in the air, the corrosiveness increases considerably. Care should be observed by the processor in selecting the proper containers and processing equipment to be used with Halane.

Corrosiveness of solutions of Halane is directly related to the pH. At pH values of 7.5 and above, Halane has no outstanding corrosive effect on copper, bronze, monel, stainless steel, galvanized iron, and dairy metal. Determinations made at pH 5 showed increased corrosion on all metals, but attack on monel and stainless steel was not excessive. At a given Halane concentration, the corrosive effect on cold rolled steel increases moderately with increasing temperature over the range 40-110°F, and sharply as the temperature rises above 110°F.

Containers: Dry Halane can be stored in fiber containers or in metal containers coated with a suitable resin or lined with polyethylene. For relatively short periods, it can be stored in ordinary cardboard. For longer storage periods, the carboard must be coated with wax or a varnish resin. Aqueous solutions of Halane can be stored or used in ceramic, stainless steel, glass, monel, or rubber containers.

(Halane is a product of the Wyandotte Chemicals Corporation, Department CP, Wyandotte, Michigan . . . or reader may secure more information about this development by simply checking CP 1648 on convenient Reader Service slip between pages two and three.)

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When inquiring check CP 1649 on handy form, pgs. 2-3

Many former users of sulphur have found that Sulphur Dioxide can be effectively and economically substituted for sulphur. Many industries have made this conversion and the results have been most satisfactory. Sulphur Dioxide, can perhaps, be just as effectively adapted to your operation. One of our representatives would be glad to consult with you—no obligation to you, of course.

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617-29 Grant Building, Atlanta, Georgia

When inquiring check CP 1650 on handy form, pgs. 2-3

Porcelain's Hardness Approached in Latest Silicone Baking Enamel— But It's Flexible

Report 50% improved hardness over other baking enamels . . . resistance to staining, abrasion, chemicals, solvents, and heat good

USES: Baking type enamel that is seen as a replacement for porcelain and galvanizing for many applications. Offers possibilities of finishing metal sheets before forming them into finished products, tests show that fence wire can be precoated before fabrication. Enamel is reported to be especially valuable as an appliance finish. Also recommended as a coating for catwalks, processing equipment, outdoor storage tanks, etc.

Features: Perhaps the most outstanding characteristic of the coating is extreme surface hardness (said to be 50% harder than conventional baking enamels) combined with unusually high film flexibility. In addition, very good resistance to staining, abrasion, chemical action, solvents, and softening under heat is exhibited. Color retention is good.

Description: Nubelon S is a modified silicone resin enamel requiring baking at 425°F. It is offered in various shades of white, gray, yellow, blue, tan, green, and red. Product is reported to compare favorably in properties and cost with porcelain, with the added advantage of flexibility and elimination of chipping and cracking.

Tests have shown far less discoloration and surface stain from atmospheric dirt accumulation than with ordinary enamels. Most soil can be removed from the surface with soap and water. Staining dyes, mustard pigmentation, fruit acids, and others are resisted. Nubelon S finish shows marked resistance to crude tall oil, carbon tetrachloride, formaldehyde, 63% ammonium nitrate (fertilizer solution), and 2-ethyl hexoic acid.

Comparative properties of a *one-coat* white Nubelon S and a high quality *two-coat* alkyd amine system are illustrated in the accompanying tabulation. The value given for "alkyd amine" is the best result obtained in each test for any system of this type.

(Enamels are products of The Glidden Co., Dept. CP, 10999 Madison Ave., Cleveland 2, O. . . . check CP 1651, pgs. 2 & 3.)

Comparative Enamel Properties

	Resistance Considered Excellent	NUBELON S Enamel	Alkyd Amine Enamel
Hardness (pencil)	6-7H	X	G
Abrasion (Taber factor)	30	X	F
Flexibility (60 in/lb impact)	no cracking	X	G+
Salt spray (in creepage in 400 hr)	0.03	X	F
Humidity (4000 hr)	no change	X	G
Hot soap (1% Rinso @ 160°F)	700-1000 hr	X	F
Hot grease vapors (8 hr @ 500°F)	no change	X	P
Stain (all household types)	no change	X	G
Heat (16 hr @ 350°F:			
Discoloration	no change	X	F
Gloss	no change	X	G

X — Excellent G — Good
F — Fair P — Poor

Granular Toxaphene to mean more effective usage

A new form of Toxaphene has proved successful in early tests, and it appears promising for control of hitherto hard-to-kill insect pests — including several species which feed below the soil's surface.

Physical form of the new type of Toxaphene is granular, the grains being approximately the size of clover seed. When applied to such crops as corn or sorghum, the granules do not cling to foliage, but fall into the whorls where budworms and armyworms are feeding, or onto the soil at the base of the plants to control cutworms, chinch bugs, and non-climbing insect pests.

Granular Toxaphene is a free-flowing material which does not drift during application, and does not cling to foliage. It has been effective against insect pests which are hard to control with dusts or sprays

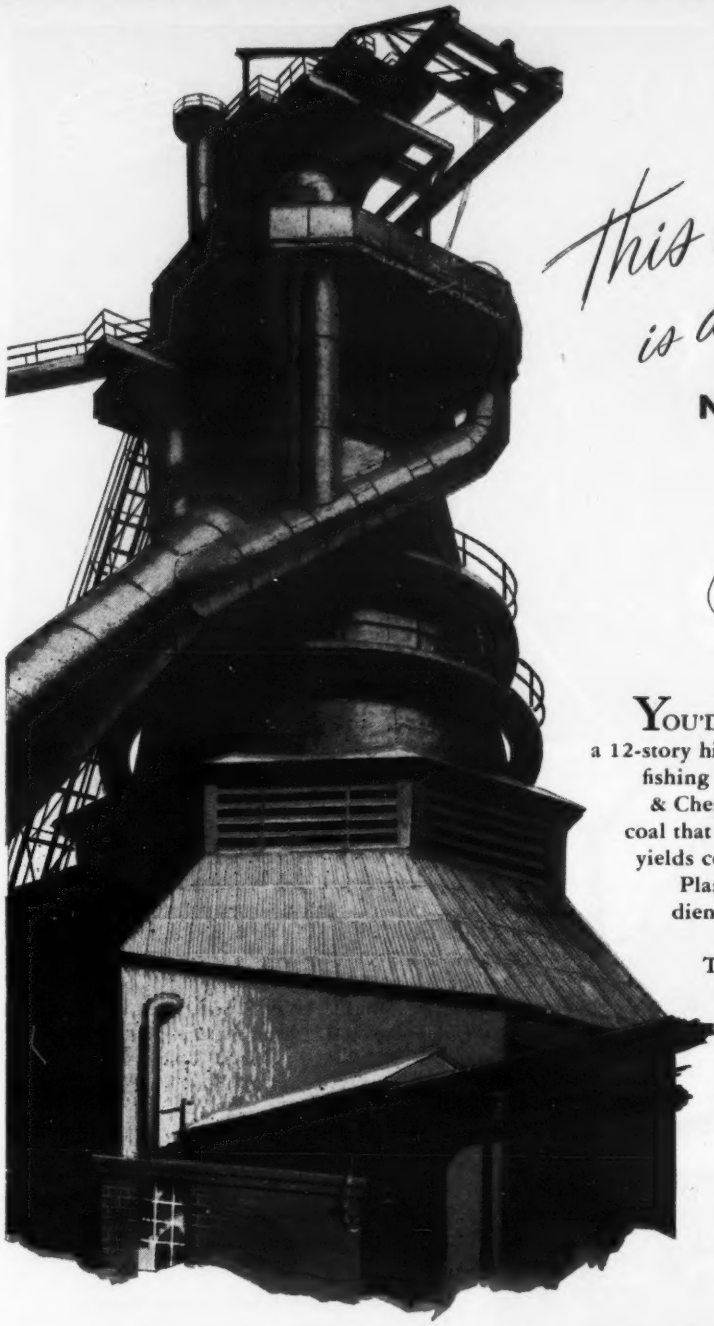
Work conducted at the South Carolina Experiment Station at Clemson on granular insecticides indicates that Toxaphene is effective in reducing crop losses from soil infesting insect pests if the granular material is worked into the soil. Further experiments on the granular products will be conducted during 1953 in important farm areas of the U.S.

(Technical Base for Toxaphene insecticides is produced by Hercules Powder Company, Dept. CP, Wilmington, Delaware . . . or for more information check CP 1652 on handy form, pages 2 and 3.)

How to make things with PVC resin

In seven pages, technical manual describes physical properties, compounding, and processing of Pliovic G90V polyvinyl chloride resin. Recommended liquid and solid plasticizers, stabilizers, and colors are listed. Literature also provides suggested formulations for calendered sheeting, film and flooring, garden hose, refrigerator gaskets, and blown film.

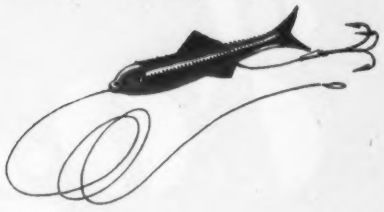
Techni-Guide PVR-100-6 is issued by Chemical Division, Goodyear Tire & Rubber Company, Dept. CP, Akron 16, Ohio. When inquiring specify CP 1653 on handy form, pages 2 and 3.



this Lady is a first cousin

to your

New Fishing Lure



YOU'D never expect to spot a kinship between a 12-story high blast furnace and a half-ounce plastic fishing lure, would you? But at Pittsburgh Coke & Chemical, the family tie is *basic.* For the very coal that produces coke for Neville Pig Iron also yields coal chemicals for making Pittsburgh PX Plasticizers, the important "flexibility ingredients" in fishing lures and a thousand other useful plastic products in your daily life. Today, in our 25th Anniversary Year, the products of the company's ten divisions are as diverse as cement and dyestuffs. Yet the production of every division is knit together, at a single plant site, in one continuous, interlocking pattern. This highly developed integration —almost without parallel in modern industry—provides distinct benefits to our customers: Assured product quality and dependable, continuing supplies . . . because Pittsburgh is *basic.*

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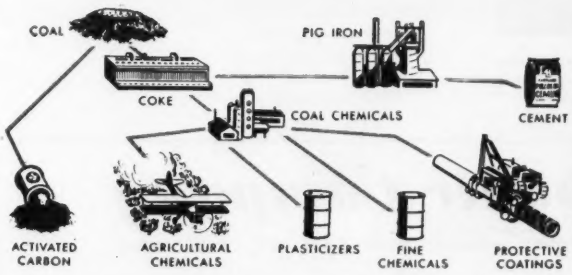

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When inquiring check CP 1654 on handy form, pgs. 2-3

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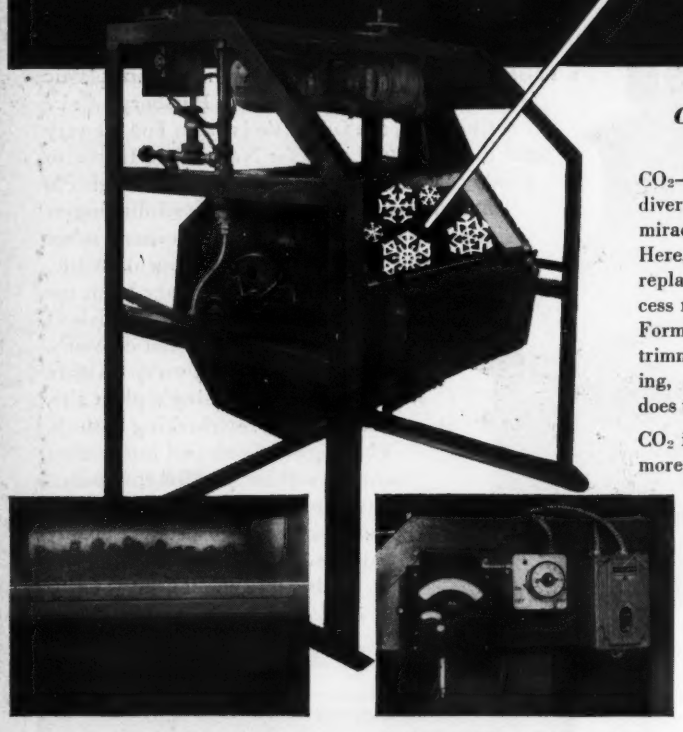
AN AIR REDUCTION PRODUCT

the magic of CO_2 . . . . . in rubber tumbling



Interior view of tumbler with parts. Note dome to right which houses thermostat control.

Modern tumbling equipment features automatic controls with thermostatic regulators and electric timers.

Cutting, trimming and burnishing molded articles at lower cost

CO_2—in meeting varying requirements and solving diverse problems for industry is nothing less than miraculous. Take rubber tumbling, for example. Here, CO_2 as "DRY-ICE" or a liquid, is fast replacing an outmoded method of trimming excess rubber squeezed out by the molding process. Formerly, these small rubber articles were cut, trimmed and burnished by hand — a time-consuming, expensive finishing operation. Today, CO_2 does the job *in quantity* better, faster and cheaper.

CO_2 in its three forms—gas, liquid, solid—is used more and more by industry as refrigerant, chemical, inert gas, pressure medium, carbonation agent. CO_2 offers a unique combination of properties — often, two or more of these properties can be employed in a single operation.

Write for additional information about low cost, convenient, adaptable CO_2 for rubber freezing and countless other uses.

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A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED

When inquiring check CP 1655 on handy form, pgs. 2-3

Excellent weathering reported for siliconized plastic water emulsion paint . . .

withstood 800 hours in Weather-O-Meter without fading; applies to almost all surfaces

Uses: Decorative coating especially recommended for masonry surfaces, however, it is equally suitable for use over other porous materials, over paint films, on bare wood, green plaster, metals (must be primed first), over cinder block, mortar, etc.

Features: Has withstood 800 hours in the Weather-O-Meter. Alkali resistance is said to be good, and resistance to weathering excellent.

Description: Maint-Corr is a siliconized plastic water emulsion paint, available in flat as well as in semi-gloss finishes. A full range of colors is available, including white, pastels, and deep shades.

Covering power of the film is reported to be unusually good.

(Product of the Maint-Corr Company, Dept. CP, 2017 "S" Street, NW, Washington, D.C. . . . or for more information check CP 1656 on handy form, pages 2 and 3.)

Forms HCl gas instead of water during sulfonation reaction

Feature of reactions with chlorosulfonic acid is that the hydrochloric acid formed in most cases is evolved as a gas as it forms. This is readily vented off and recovered by absorption. In contrast, reactions with sulfuric acid usually produce water.

This becomes a dilution problem and results in quantities of "spent" acid which must be reconcentrated or disposed of. In reactions with chlorosulfonic acid, evolution of HCl gas is also an indication of reaction progress.

Properties, reactions and applications of material are compiled in detailed, 12-page bulletin. In addition to this information, bulletin also includes a section dealing with proper storage and safe handling of chlorosulfonic acid.

Technical Bulletin No. 0-96 is issued by Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. When inquiring specify CP 1657 on handy form, pages 2 and 3.

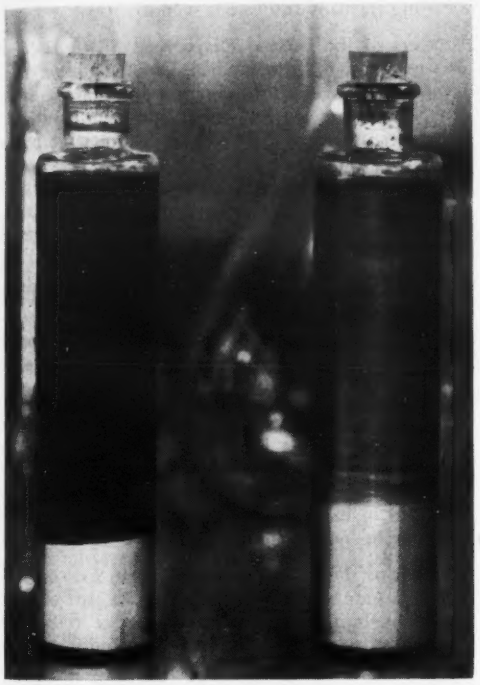
Improved dispersibility highlighted in Al pigment

MD-515 is the name that is being applied to a new high-pigment-volume aluminum paste which is reported to retain itself in suspension longer, have greater leafing rate, and disperse more easily. Pigment is especially recommended for stable ready-mixed aluminum paints.

Covering capacity of the pigment exceeds that of the standard lining grades, but is generally coarser in mesh size. It meets Federal Specification TT-A-468a

Type II Class B and ASTM Specification D 962-49 Type II Class B.

MD-515 settles to a higher pigment volume and provides a softer consistency in aluminum paint because of particle size distribution. This makes the pigment advantageous in vehicles of heavier body



Left-hand bottle contains standard aluminum paste. Bottle on right contains MD-515 High Pigment Volume Aluminum Paste. Note dispersion of pigment in right-hand bottle as compared with compact settling in bottom of left-hand bottle

and extends the use of ordinary lining pigments. Paints made with it are reported to be bright and diffuse in appearance, making them ideal for exterior maintenance and interior illumination. Diffuse reflectance minimizes highlighting and glare.

(Product of the Metals Disintegrating Company, Inc., Dept CP, Elizabeth, New Jersey . . .check CP 1658, pgs. 2 & 3.)

"Static Electricity in Textiles"

This is the title of a new fourteen-page illustrated bulletin on the topic. Made up of two papers presented recently, one covers the history of static electricity: other treats problems caused by static electricity and methods of control.

Bulletin is issued by the Dexter Chemical Corporation, Textile Chemical Div., Dept. CP, 819 Edgewater Road, New York 59, New York. When inquiring specify CP 1659 on handy form, pages 2 and 3.

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SODIUM NITRITE

U. S. P.

Sodium Nitrite has long had many important uses in American industry. Many industries are now using this versatile product to do a variety of jobs. What can Solvay Sodium Nitrite do for you? For technical information on specific uses of Solvay Sodium Nitrite, write on your business letterhead to the address below.

Physical and Chemical Properties

Molecular Weight: 69.01.

Solubility in Water: 20% at −12° C., 39% at −26°C. (eutectic). 50% at 42°C., 60% at 90°C. Slightly soluble in alcohols, very soluble in anhydrous ammonia.

Negative heat of solution.

Melting Point: 271°C., decomposes at 320°C.

Appearance: Crystalline, slight yellow cast, almost 100% will pass through a No. 20 screen.

Reactions: Can be either a reducing or oxidizing agent. Provides NO_2 for azo reaction.

Quality: U.S.P. grade. Better than 99% $NaNO_2$, very low in chlorides and metallic impurities.

DO YOU HAVE A CORROSION PROBLEM?

Solvay Sodium Nitrite is an excellent anti-corrosion agent that will not injure the skin of a normal person. It will however protect a wide variety of metals including iron and steel.

Among the current applications utilizing this property of Solvay Sodium Nitrite are: prevention of corrosion in air conditioning units and circulating water systems; as a corrosion inhibitor in water base paints, water soluble hydraulic fluids, metal cutting and grinding compounds; as a rust preventive in household scouring pads and radiator anti-freeze compounds.

Do you have a corrosion problem that could be solved with Solvay Sodium Nitrite?

USES FOR SOLVAY SODIUM NITRITE

METAL INDUSTRY

- for corrosion prevention
- for detinning
- for heat treating salts
- for oxidizing compounds
- for enameling
- for specialized metal cleaning compounds

MEAT PACKING

- as a color fixative for meats

TEXTILE INDUSTRY

- in azo dyeing

ORGANIC CHEMICAL SYNTHESIS

- provides nitrite ion for diazonium reaction

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When inquiring check CP 1660 on handy form, pgs. 2-3

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Electrochemicals Dept., Wilmington 98, Del.

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STRONG AND FLEXIBLE—resists tearing and abrasion. Stable to sunlight and artificial light. Properties may be varied with plasticizers.

EASILY MODIFIED with plasticizers, extenders, gelling agents, colors, flame-retardants, etc.

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When inquiring check CP 1661 on handy form, pgs. 2-3

Wood by-products yield oxidative stabilizers

Two new antioxidants (α- and β-conidendrol) have been compared with accepted stabilizers in a variety of products by chemists of the Bureau of Agricultural and Industrial Chemistry. Products are polyphenolic compounds derived from conidendrin, a substance occurring in many coniferous woods.

Members of the Oilseed Division of SRRL in New Orleans tested the conidendrols as inhibitors of oxidative rancidity in cottonseed and peanut oils, in lard, in fat-containing candies, as stabilizers of synthetic rubber against aging and hardening, and as inhibitors of polymerization of certain vinyl-type monomers. They found that the conidendrols performed as well as or better than a number of the accepted stabilizers, including some marketed at higher prices than would be the conidendrols.

Since conidendrin, the parent material, is plentiful as a waste product during the pulping of western hemlock — an estimated 10-15 pounds can be recovered from the pulping of one ton — the derivatives would be of interest as potential replacements or supplements for stabilizers obtained from coal tar.

Before the conidendrols can be considered for use in stabilizing food products, toxicity studies now under way at the WRRL must be completed. One firm is interested in manufacturing the conidendrols if they prove to be non-toxic.

Chemists of the SRRL were the first to use conidendrin as a source of new stabilizers. As part of their research on improving the utilization of cottonseed and peanut oils, they converted conidendrin to norconidendrin, and applied the norconidendrin in tests of the keeping qualities of the oils. On the basis of the laboratory process used by these scientists to produce norconidendrin, it was feasible for a commercial company to produce on a pilot plant scale the similar compound, α-conidendrol, and also the new derivative, β-conidendrol.

(Information courtesy of USDA, Agricultural Research Administration, Bureau of Agricultural and Industrial Chemistry, New Orleans 19, Louisiana)

High mol wt aliphatic amides have variety of applications

Versatile derivatives of fatty acids, high molecular weight aliphatic amides have applications in the manufacture of plastics, pressure-sensitive tapes, molded rubber products, protective coatings, printing inks and water repellents — to mention but a few. General uses include applications as a mutual solvent or anti-block agents in back coatings for pressure-sensitive tapes.

Composition, general uses, chemical properties and applications of these wax-like materials are discussed in graphic, 24-page booklet. Melting points of compounds range from 68 to 104°C.

"Armids" is issued by Armour Chemical Div., 1355 W. 31st St., Chicago 9, Ill. When inquiring specify CP 1662 on handy form, pages 2 & 3.

Requires no aging or temp controls in preparing . . .

solution for bonding rubber to fabric

Uses: In dip preparations to obtain adhesion between rubber and fabric.

Features: No aging or temperature controls are required in preparing the resin solution; dips containing resin are stable for a month or more if storage temp does not exceed 80°F.

Description: Gen-Tac Resin is a water-soluble, phenol-formaldehyde resin. It is supplied in fine powder form and dissolves readily with simple stirring.

Dynamic test on tires, including road tests, have been conducted on dips containing resin and Gen-Tac Latex with satisfactory results.

Casein-reclaim-latex dips have been improved through use of resin and Gen-Tac Latex. In addition, since Gen-Tac Resin is not water-resoluble as with casein, moisture does not deteriorate the adhesions as rapidly.

(Announced by Harwick Standard Chemical Co., Dept. CP, 60 South Seiberling St., Akron 5, Ohio . . . or for more information check CP 1663 on convenient Reader Service slip, pages 2 and 3.)

Pelargonic acid — purified grade

Three-page technical folder gives tentative specifications, chemical and physical properties, and packaging and storage methods for purified grade of pelargonic acid. Applications are suggested. Typical analysis of the material, now available in pilot plant quantities, is: 91% pelargonic acid, 5% caprylic acid, 4% capric acid.

Tech Bul 46 is issued by Dept. 5, Emery Industries, Inc., Dept. CP, Carew Tower, Cincinnati 2, Ohio. When inquiring reader may simply specify CP 1664 on convenient Reader Service slip, pages two and three.

For more information on product at right, specify CP 1665 . . . see information request blank between pages 2 - 3.

NEW CHAPTERS IN AN OLD STORY*

From knowledge gained by long experience, Niagara is constantly adding new chapters to the continued story of chemicals in industry.

NIALK® Carbonate of Potash

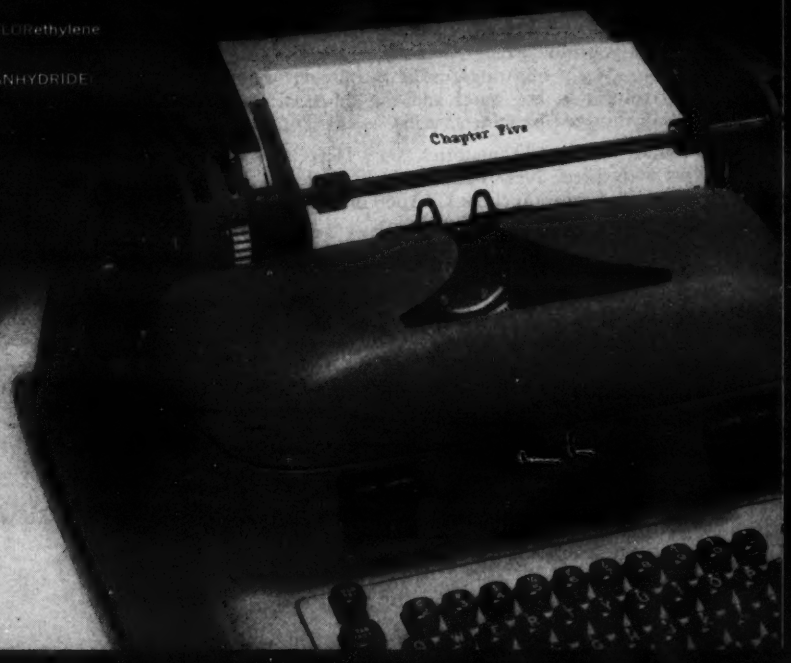
Unsurpassed for purity and uniformity, NIALK Carbonate of Potash is widely used in the development and production of glass of exceptional clarity and freedom from flaws for both optical and decorative use.

Strict production standards plus continuing application studies have earned for this NIALK product—as for every NIALK product—industry's unqualified acceptance.

NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, New York

* NIALK LIQUID CHLORINE NIALK CAUSTIC POTASH
NIALK CARBONATE OF POTASH NIALK PARADICHLOROBENZENE
NIALK CAUSTIC SODA NIALK TRICHLOROethylene
NIAGATHAL (TETRACHLORO PHTHALIC ANHYDRIDE)



Ten new chemicals added to specialty line

Announced is the availability of ten new chemical products:

1) *Acetaldoxime* (*acetaldehyde oxime*): CH_3CH:NOH. White crystals, melting point 47°C, boiling point 115°, density 0.966, very soluble in water, alcohol, ether.

2) *3-Acetylpyridine*: C_7H_7NO. Colorless liquid, boiling point 220°C. A nicotinic acid antagonist. Forms the oxime and the phenylhydrazone.

3) *Adonidin*: A glucoside mixture extracted from the leaves of Adonis Vernalis. Light brown, very bitter tasting, freely soluble in water and alcohol, insoluble in ether and chloroform. Has been used as a cardiac stimulant.

4) *Agmatin sulfate* (*l-amino-4-guanidobutane sulfate*): $C_5H_{14}N_4$:H_2SO_4. White crystals, melting point 231°C, soluble in water, insoluble in alcohol. Compound is chemically related to Arginine.

5) *l-Carnosine* (*β-alanylhistidine*): $C_9H_{14}N_4O_3$. White crystals, melting point 248°C, $(\alpha) = 24.1°$. Very soluble in water with alkaline reaction.

6) *Chondroitinsulfuric acid*: High molecular weight mucoprotein.

7) *dl-Glyceraldehyde*: $C_3H_6O_3$. Tasteless crystals, melting point 145°C, boiling point 146°C at 0.8 mm pressure. Soluble in water, insoluble in benzene and petroleum ether. As the simplest aldose, compound plays an important role in the fermentation of sugars.

8) *Retene* (*l-methyl-7-isopropylphenanthrene*): $C_{18}H_{18}$. Crystals with melting point 99°C, boiling point 393°C. Insoluble in water, soluble in hot alcohol, benzene, hot ether. Occurs in pine tar and in high boiling tar oils.

9) *Veratric acid* (*3,4-dimethoxybenzoic acid*): $C_9H_{10}O_4$. Odorless crystals, melting point 181°C, sublimes readily. Slightly soluble in cold water, more soluble in boiling water, very soluble in alcohol and ether.

10) *Xanthosine* (*xanthine riboside*): $C_{10}H_{12}N_4O_6$. Colorless crystals which decompose on heating. $(\alpha) = -51.2°$. Sparingly soluble in cold water, freely soluble in hot water and hot dilute alcohol. Easily hydrolyzed by mineral acids.

(Products of Bios Laboratories, Inc., Dept. CP, 17 West 60th Street, New York 23, New York. . . . or for more information check CP 1666 on handy form, pages 2 and 3).

Pigment provides chalk resistance in exterior paint products

According to manufacturer, this titanium dioxide pigment has been found by exhaustive tests to be more resistant to chalking and fading than any other titanium dioxide pigment. It is particularly suitable for pigmentation of organic coatings that require the highest degree of tint retention under severe conditions of exposure.

Bulletin describes durability characteristics and the

ECONOMICAL EMULSIONS FOR MANY FIELDS POSSIBLE WITH ARMOUR'S EMULSIFIERS

By Dr. M. R. McCorkle, Technical Director, Armour Chemical Division

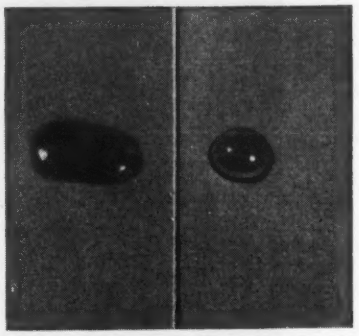
Emulsions covering a vast number of uses are now possible and profitable through the use of Armour chemicals as emulsifiers. Today, emulsions are used as an improved method for applying many chemicals, and frequently afford a safer, more economical means of handling them than is possible using any other method.

In providing for the dispersion of grease, fat, wax, resin or other oil-soluble, water-insoluble products, the uniformity and dispersion of the material depends largely on the effectiveness of the emulsifier, rather than upon the mechanical agitation of the emulsion. Thus stable emulsions of fine particle size are possible with minimum agitation with the proper emulsifier.

Armour has recently provided an extensive range of excellent emulsifiers, making available to the emulsion technologist a wide choice of compounds and presenting possibilities almost without limit. It is important to remember that combinations of emulsifiers are often more efficient than any single emulsifier. We will be glad to discuss your emulsion problems and suggest formulations, either of single emulsifiers or combinations, to solve specific problems involving dispersion, plating out or handling of chemicals.

Emulsions have proved particularly useful as an economical and efficient method for dispersing insecticides, parasiticides and fungicides. In this application an oil-soluble but water-insoluble chemical, like DDT, chlordane or 2,4-D is dissolved in a suitable solvent, like kerosene. An emulsifier is added to the solution. The resulting emulsifiable concentrate can be mixed with water in the field to form the spray liquid, a long-lasting emulsion which requires only minimum agitation.

Armour has developed cationic and non-ionic emulsifiers that are not affected by water hardness. Cationic emulsifiers tend to exhaust their oil phases on, and bind them to, many types of surfaces such as wood, animal hair, cellulose and concrete. This property enhances the effectiveness of insecticides by promoting adhesion and improving weather resistance. Arquad 2C is a strongly cationic surface active agent that is an excellent emulsifier of this type. Ethomeens S/12 and S/15 can be combined in extremely low concentrations to form a very effective, mildly cationic emulsifier for 2,4-D isopropyl ester. Ethofat 142/20, another cationic emulsifier, is so efficient that chlordane can be emulsified directly into water without the use of a solvent. The fact that these emulsifiers are not affected by water hardness greatly increases the range of their use since untreated water, in hard water areas, can be used safely and efficiently.



Spreading of the water drop on the left indicates surface wetting on conventionally emulsified Carnauba coating. Water drop on right—with no wetting—is on coating of Carnauba emulsified by new Armour chemical.

A combination of Armac T and Ethomeen S/25 has made possible improved water resistance and non-spotting characteristics of Carnauba wax emulsions for floor waxes, etc. The photograph shows the water resistance of this new Carnauba emulsifier (right) as compared to a conventional emulsifier (left). Both coatings were allowed to dry 15 minutes. Four drops of water were applied to each and photographed 1½ minutes later. The Armac-Ethomeen formulation gives permanent water repellency immediately upon drying.

Aromatic or chlorinated solvents can be emulsified in water to form degreasers or cleaners. Fabrics, glass or plastics can be coated with solvents, oil, wax or other compounds to provide such characteristics as water repellency, or even to give corrosion resistance. In cosmetic formulations such as hair oils, hand creams or shaving creams, the desired bland, creamy effect can be enhanced by the choice of an efficient emulsifier which insures a long-lasting suspension of fine particle size.

Recent work has produced simple answers to what have previously been considered difficult or unsolvable problems. A 40% fluid emulsion of paraffin with fine particle size is now possible. This emulsion will remain fluid when cooled below the melting point of the paraffin. Another development uses Ethomeens to emulsify mineral oil in the presence of strong mineral acids, such as sulfuric or hydrochloric. And a clear emulsion of latus petroleum oil is possible using Ethofat 142/20.

For complete information on these Armour emulsifiers, send the coupon for your free copy of Technical Bulletin F-2.

INERT KETONES WITH WIDE COMPATIBILITIES USEFUL IN COATINGS AND FINISHES

Three higher molecular weight aliphatic ketones—Stearone, Laurone and Oleone—provide characteristics useful in coatings, finishes and waxes. They are particularly inert compounds, even more so than most fatty ketones. Unaffected by high temperatures, acids, alkalis and other strong reagents, these ketones are subject to only a few reactions under rigorous conditions.

Stearone, Laurone and Oleone have a wide range of compatibility with many waxes, such as high-melting vegetable waxes, microcrystalline waxes and paraffin waxes. They are also compatible with triglycerides and fatty acids such as stearic. In 20-30% concentration, they form a solid paste with many solvents at room temperature. They are insoluble in water and only slightly soluble in inorganic solvents at room temperature.

The inert chemical nature of these fatty ketones and their resistance to degradation by high temperatures suggest a number of applications where these high-melting, wax-like materials may prove advantageous. Such applications include their use in wax and polish formulations, as mold release agents, resin lubricants and anti-blocking agents, as flattening agents for paints and varnishes, as ingredients in waterproofing compounds, components in electrical insulations, protective coatings, cosmetic formulations, as lubricants for vinyl calandering and extrusion, and as anti-blocking agents for coatings and films.

Samples of these three ketones are available, with which you can carry on your own testing for applications of value to you. Stearone is commercially available in 50-lb. multiwall bags, while Oleone and Laurone are available in quantities ranging from one to one hundred pounds.

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ARMOUR CHEMICAL DIVISION
ARMOUR AND COMPANY · 1355 WEST 31ST STREET · CHICAGO 9, ILLINOIS

PRODUCT DEVELOPMENT AND IMPROVEMENT WITH COMMERCIALLY PURE MYRISTIC ACID

Neo-Fat®14—Armour's commercially pure myristic acid—averages 94% myristic, 3% lauric and 3% palmitic acid content. This purity, of a degree never before commercially available, is due to Armour's patented fractional distillation process. It provides you with an outstanding material for the improvement of present products and the development of new compounds.

SPECIFICATIONS	MIN.	MAX.
Iodine No.	—	1.0
Acid Value	243	249
Titer, °C.	48	52
Unsaponifiable	—	0.2%
Moisture	—	0.2%
Color, Lov. 5¼"	—	1R-10Y
Odor	Characteristic	
Appearance	Characteristic	

SOLUBILITY AND COMPATIBILITY

At 60°C., Neo-Fat 14 is soluble in acetone, amyl acetate, benzol, butanol, carbon tetrachloride, dipentene, ethanol 90% and 100%, kerosene, methyl cellosolve, turpentine, V.M.&P. naphtha and xylol.

It is compatible at 60°C. with alkyd resins, asphalt, beeswax, carnauba wax, linseed oil, paraffin wax, petroleum pale oil and soybean oil.

USES

Many references have been made in recent literature to the use of various Neo-Fat 14 derivatives in detergents, dyes, textiles,

wetting agents, lubrication oils and greases, and other industrial applications. Alcohols, nitriles, amine esters and metallic soaps may be produced easily and find innumerable applications. Some specific uses follow.

Glyceryl monomyristate may be used as a substitute for coco butter in suppositories and similar products. It is not as soft or oily as coco butter, but it is more water absorbent. It has superior soothing qualities and is more readily miscible with other chemicals of a water soluble nature.

Neo-Fat 14 or its metallic soaps have been used in rubber compounding, synthetic resins, paints, and in grease compounding.

The sodium or potassium soaps of Neo-Fat 14 have remarkable sudsing and wetting action without the skin-irritating characteristics found in most free lathering soaps. For this reason it should be most suitable for use in cosmetics, shampoos, shaving creams, and other applications where skin irritation is undesirable. Neo-Fat 14 is also used in the preparation of agricultural parasiticides.

Neo-Fat 14 is available for immediate shipment in flake form both in 50-pound multi-wall bags and in aluminum tank cars. Send the coupon today on your letterhead for free samples and current price quotations.

PURE CAPRYLIC AND CAPRIC ACIDS CAN BE BUILDING BLOCKS FOR MANY NEW PRODUCTS

The availability of Armour's high purity caprylic (Neo-Fat 8) and capric (Neo-Fat 10) acids should interest many processors working on new product development, particularly that involving organic synthesis.

These two coco fractions are available with purity of 92% or above. The average composition of Neo-Fat 8 is 93% caprylic, 4% capric, and 3% caproic. Neo-Fat 10 averages 92% capric, 5% lauric and 3% caprylic acids.

SPECIFICATIONS

Neo-Fat 8: titer, 16°C. max.; iodine value 1 max.; acid value of 387 to 392; moisture and unsaponifiable content both 0.2%; and color, Lovibond 5¼", 2R to 20Y max.

Neo-Fat 10: titer, 28 to 33; iodine value 1 max.; acid value of 323 to 329; moistrue and unsaponifiable content both 0.2%; and color, Lovibond 5¼", 2R to 20Y max.

SOLUBILITY AND COMPATIBILITY

Both Neo-Fat 8 and 10 are soluble in the following (Neo-Fat 8 in all proportions): acetone, amyl acetate, benzol, butanol, carbon tetrachloride, dipentene, ethanol 95% and 100%, ethyl ether, ethylene glycol, kerosene, methyl cellosolve, turpentine, V.M.&P. naphtha, and xylol.

Both are compatible (at 60°C.) with the following: asphalt, beeswax, carnauba wax, ester gum, gum resin, linseed oil, paraffin wax, petroleum pale oil and soybean oil.

NEO-FAT 8 USES

Due to its exceptionally high purity, Neo-Fat 8 is an excellent raw material for producing derivatives of caprylic acid, such as alcohols, aldehydes, ketones, esters, metallic salts, nitriles, amides, amines, and other such products. The pure acid or its derivatives find use in the manufacture of essences, synthetic perfumes, flavors, artificial leather, among other applications. It is also used in anti-foaming agents, dyestuffs, pharmaceuticals, and as a manufacturing intermediate in many synthetic organic compounds.

Sodium caprylate is used extensively as a germicide and antiseptic in athlete's foot ointments and lotions. And as a parasiticide, the addition of 1-5,000 caprylic acid in economic poisons kills 90% of the black chrysanthemum aphid.

Esters of caprylic acids with diethylene, triethylene and propylene glycols are suitable plasticizers for ethyl and nitro-cellulose, polyvinyl acetal, etc. Triethylene glycol dicaprylate is used with other plasticizers in vinyl-vinylidine copolymers to act as an extrusion aid. Neo-Fat 8 may also be used as a high boiling solvent for plastics, varnishes, gums, etc.

NEO-FAT 10 USES

Neo-Fat 10 is an excellent raw material for producing alcohols, aldehydes, ketones, esters, metallic salts, nitriles, amides, amines and other derivatives of capric acid which find many varied uses in the chemical industry and in many other fields.

In an insecticide formulation, the addition of 1-1200 Neo-Fat 10 killed more than 99% of the green apple aphid. In another field, 0.1-1% capric to myristic in polysiloxane lubricants gives low-boundary friction co-efficients. In other applications, capric acid finds use in the manufacture of essences, synthetic perfumes, flavors, disinfectants, anti-foaming agents, dyestuffs, pharmaceuticals, high boiling solvents for paints, varnishes, plastics, gums, etc., and as a manufacturing intermediate in many synthetic organic compounds.

Samples of these two versatile chemicals can show you how readily they can be put to work for you. Write today on your letterhead for these samples.

Send samples: ☐ Stearone ☐ Laurone ☐ Oleone ☐ Neo-Fat 8 ☐ Neo-Fat 10 ☐ Neo-Fat 14

Send literature: ☐ Tech. Bulletin F-2, "Armour Emulsifiers" ☐ Ketone Bulletin G-1 ☐ Tech. Bulletin E-4, "Emulsifiers for Insecticides"

Name ..... Title .....

Firm .....

Address .....

City ..... Zone ..... State .....

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When inquiring check CP 1667 on handy form, pgs. 2-3

important paint making properties of rutile titanium dioxide pigment. Brief review of the mechanism of weathering failure of pigmented coatings is included to illustrate relation of titanium dioxide pigment to other film constituents. Typical weathering data are presented to show how this type of pigment will perform in various exterior surface coatings. Applications of product are discussed.

Technical Bulletin No. 905 is issued by Calco Chemical Div., American Cyanamid Co., Dept. CP, Bound Brook, N. J. When inquiring specify CP 1668 on convenient Reader Service slip, pages two and three.

Recommend dulling agent for viscose, acetates

A high-titanium-content dulling agent in highly dispersed form is being offered to textile processors for use with viscose and acetate fabrics, both whites and pastels. It is reported to be particularly effective with urea-formaldehyde resins, and especially applicable as a dulling agent with resins for hosiery finishing. The agent readily disperses in cold water, and pigments remain well dispersed when diluted.

General formula for use of Dextrol Duller #3925 cannot be specified because the amounts required, as well as other factors, will depend on type of fabric and degree of dulling desired. A typical formula for use on all viscose and all acetate marquisettes is given as a general guide:

Dextrol Duller #3925	96 lb
Urea-formaldehyde resin	90 lb
AC catalyst	4½ lb

These components are added to cold water in order listed, and then agitated. Volume is brought up to 210 gal; batch is ready for use after straining. It is applied by pad at room temperature, followed by drying viscose at 310°F and acetates at 310°F.

(Product of the Dexter Chemical Corporation, Textile Chemical Div., Dept. CP, 819 Edgewater Road, New York 59, New York . . . or for more information check CP 1669 on handy form, pages 2 and 3.)

Prices and facilities for metals analyses

Chemical, physical, and metallurgical tests which these laboratories conduct on metals (alloys, minerals, ores, and scrap) are outlined in new 4-page bulletin. Covered are the prices for single-sample analyses (chemical, spectrographic and spectrophotometric) of elements and also physical and comprehensive tests.

Research and development facilities are outlined. Bul 13 is issued by Raymond C. Crippen Laboratories, Dept. CP, 1138 East North Avenue, Baltimore 3, Maryland. When inquiring specify CP 1670 on handy form, pages 2 and 3.

Another new development using

B. F. Goodrich Chemical *raw materials*

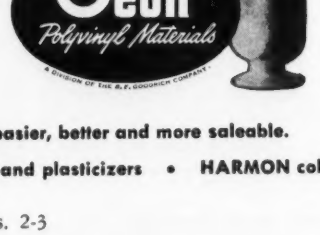
Drum lined with Geon-based plastisol—used for shipping acid.

Unbeatable Drum for Acid

. . . can be used again and again!

THE plastisol lining in the drum pictured is a lifesaver for the drum—and a cost-saver for the shipper! The plastisol is made with Geon paste resin. It protects the metal against corrosion by sulfuric acid, ferric sulfate, sodium hypochlorite and other acids and corrosive chemicals. It permits use of ordinary metal drums, instead of breakable containers. And these plastisol-lined drums can be used over and over. Some have been on the job for three years! You can see how this Geon-based plastisol cuts costs.

Perhaps a plastisol like this can help you improve or develop products to make savings—to bring in more sales. For Geon-based plastisols can be used to coat, cast, mold or dip. They resist heat and cold, oils, greases, aging, abrasion and many chemicals. They require no expensive mixing equipment, no solvents, no recovery systems. For helpful, technical information on their uses, or on your specific requirement, please write Dept. GF-3, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.



GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors

When inquiring check CP 1671 on handy form, pgs. 2-3

Surface active agent is compatible with all latices . . .

aids pigment dispersion and prevents foaming in latex emulsion paints

Uses: Water dispersible lecithin compound for use in latex emulsion paints, where it acts as a surface active agent . . . aiding pigment dispersion and preventing foaming.

Features: Reported to be completely compatible with all latices regardless of chemical structure, and with casein and various isolated soya proteins. Other advantages include: gives latex emulsion paints creamy consistency and aids brushing and leveling . . . prevents hard caking of pigments . . . improves adhesion . . . acts as an antioxidant to prevent hardening of dried film . . . improves the compatibility of oils, oleoresinous varnishes and alkyds with the basic latices . . . and acts as an emulsion stabilizer to minimize breakdown of pigmented emulsions whether from mechanical, chemical or microbial action.

Description: Clearate WD water dispersible lecithin compound has the following specifications:

Physical:	
Bulking value, gal (1 lb bulks)	0.115
Color, Gardner	12–
Specific gravity @ 77°F	1.045
Viscosity @ 77°F (G-H)	Z4+
Lb/gal @ 77°F	8.70
Chemical:	
Acetone insoluble lecithin	56
Acid number	10-30
Moisture, % max	1.5
Non-volatile, %	99

(Product of Naftone, Incorporated, Dept. CP, 515 Madison Avenue, New York 22, New York . . . or for more information check CP 1672 on handy form, pages 2 and 3.)

Explains how wetting agents improve fertilizers

Nineteen most frequently asked questions on the use of wetting agents in fertilizer to speed reaction and improve ultimate texture are answered in a recently published booklet. Pointed out is that one pound of maker's Santomerse No. 1 Spray Dried per ton of fertilizer permits proper reactions to take place in optimum time without the addition of excess water. The new technique is said to be particularly useful in the processing of higher analysis goods.

In addition to speeding reactions, use of this particular wetting agent (an alkyl aryl sulfonate) has demonstrated ability to produce better flowability and texture, insure against setting up in bags or storage, and is a proven economy in operation . . . according to maker.

Copies are available from Phosphate Division, Monsanto Chemical Company, Dept. CP, St. Louis 4, Missouri. When inquiring specify CP 1673 on handy form, pages 2 and 3.

Rapid dispersibility when poured into water . . .

anionic emulsifiers for toxicant sprays

Uses: Toximul 300 is recommended for toxaphene, chlordane, DDT, 2,4D and aldrin; Toximul 400 is preferred for BHC, lindane, dieldrin, parathion and for 2,4,5T.

Features: Flash dispersibility when concentrates are added to water, slow creaming rates, and perform equally well in hard or soft waters.

Description: Toximul 300 and Toximul 400 are manufacturer's latest development in field of anionic agricultural emulsifiers. Using them as the sole emulifiers, it is possible with proper formulation to obtain emulsions of at least a dozen different toxicants — thus eliminating need for stocking different emulsifiers.

Concentrates containing these emulsifiers exhibit high stability, or shelf life, on aging tests.

(Products of Ninol Laboratories, Dept. CP, 1719 S. Clinton St., Chicago 16, Ill. . . . or for more information check CP 1674 on handy Reader Service slip, pages two and three.)

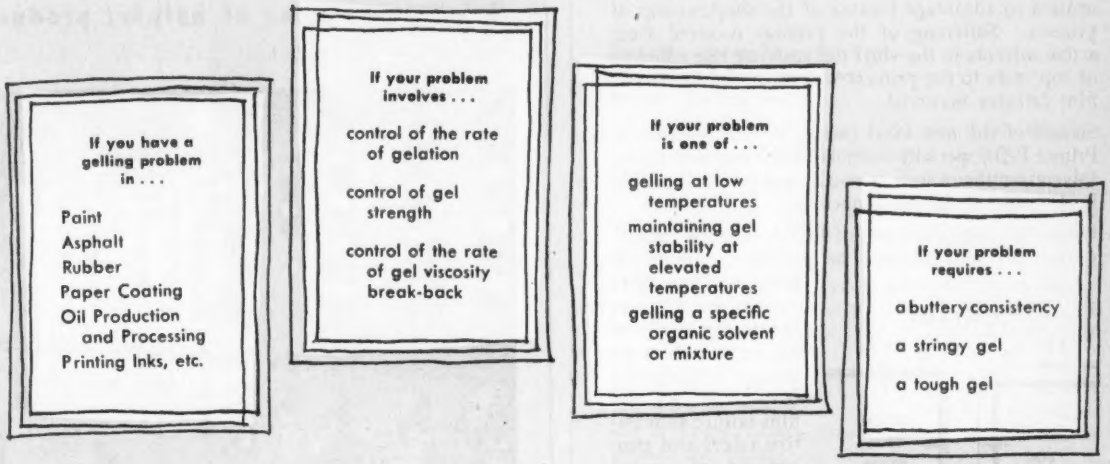
Rubber survey — 75 pages

Publication of a major study of rubber has been announced by the National Security Resources Board. The study is the most recent addition to a survey of strategic materials. Covered are natural and synthetic rubbers, description of rubber types, production processes, raw material sources, general statistics, industry in general, and a summary of government controls and experience.

Rubber Materials Survey (75 pages) is available upon remittance of $1.50 direct to Sales Office, Superintendent of Documents, Washington 25, District of Columbia.

For more information on product at right, specify CP 1675 . . . see information request blank between pages 2 - 3.

Need a Special Gelling Agent for organic solvents?


If you have a gelling problem in . . .
Paint
Asphalt
Rubber
Paper Coating
Oil Production and Processing
Printing Inks, etc.
If your problem involves . . .
control of the rate of gelation
control of gel strength
control of the rate of gel viscosity break-back
If your problem is one of . . .
gelling at low temperatures
maintaining gel stability at elevated temperatures
gelling a specific organic solvent or mixture
If your problem requires . . .
a buttery consistency
a stringy gel
a tough gel

In fact, whatever your gelling problem is . . .

call on WITCO!

WITCO's Research and Development Laboratories have accumulated a vast backlog of experience in the formulation and production of quality gelling agents for organic media. This experience is at your service.

Here are two of the typical problems solved by Witco gelling agents:

Problem: To gel a hydrocarbon solvent at room temperature in 15 minutes but not less than 10 minutes . . . to attain an ultimate gel strength of ½ million centipoises at 150°F in one hour . . . to maintain this strength for two hours . . . then break back to approximate viscosity of solvent within 24 hours.

Problem: To gel a light hydrocarbon at 80°F in 5 to 10 minutes . . . reach an ultimate viscosity of approximately 1 million centipoises . . . and maintain this viscosity for several months at 150°F.

Want specific information or samples? Like to have a Technical Service Representative call? *Mail this coupon today*—no obligation, of course.

WITCO

WITCO CHEMICAL COMPANY

260 Madison Avenue, New York 16, N. Y.

LOS ANGELES • BOSTON • CHICAGO • HOUSTON • CLEVELAND
SAN FRANCISCO • AKRON • LONDON AND MANCHESTER, ENGLAND

WITCO CHEMICAL COMPANY CP
260 Madison Avenue, New York 16, N. Y.

☐ Please send technical data on Witco Gelling Agents
☐ Have your representative call
☐ Send samples of appropriate Gelling Agent

INTENDED END USE OR GELLING PROBLEM: (this information needed so that appropriate data or samples may be submitted)

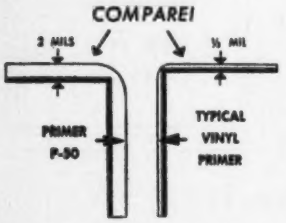
NAME_____
COMPANY_____
TITLE_____
ADDRESS_____

Use of vinyl coatings extended by primer's good adhesion, active-solvent resistance

Vinyl coatings can now be put to unlimited application in the chemical process industries since the development of new vinyl coating technology, it is reported. Too often in the past the highly desirable chemical resistance of vinyl top coats could not be utilized to advantage because of the shortcomings of primers. Softening of the primers occurred from active solvents in the vinyl top coats, or else adhesion of top coats to the primers was poor, and premature film failures occurred.

Success of the new vinyl coating system is based on Primer P-50, specially formulated for use with active-solvent synthetics such as vinyls, and possessing highly desirable drying-oil properties.

One of the big advantages of P-50 is its good "build" (2 mil dry film thickness on flat areas), for it has been shown that "edge build" or "buttering up" of all prominences or surface irregularities is essential to avoid film failure at sensitive edges and projections of coated object.



The built edge of Primer P-50 (left) provides a surface that promotes greater-than-normal edge build when subsequent vinyl top coats are applied

Drying oil properties of P-50 are responsible for the unusually good adhesion give to vinyl systems — locking the primer to its base, and at the same time locking the vinyl top coat to the primer. The primer is reported to be easily bonded to most old paints, whether oil-base, rubber-base, vinyl, or oleoresinous.

Another important aspect of P-50 is its ability to control underfilm corrosion and rust creepage. Heavy pigmentation with zinc chromate and drying oil properties of the primer offer this advantage.

Good brushing characteristics are reported for P-50. The material is said to offer unusually high gloss vinyl top coats.

(Primer P-50 is a development of Prufcoat Laboratories, Incorporated, Dept. CP, 50 East 42nd Street, New York 17, New York . . . or for more information check CP 1676 on handy Reader Service slip between pages 2 and 3.)

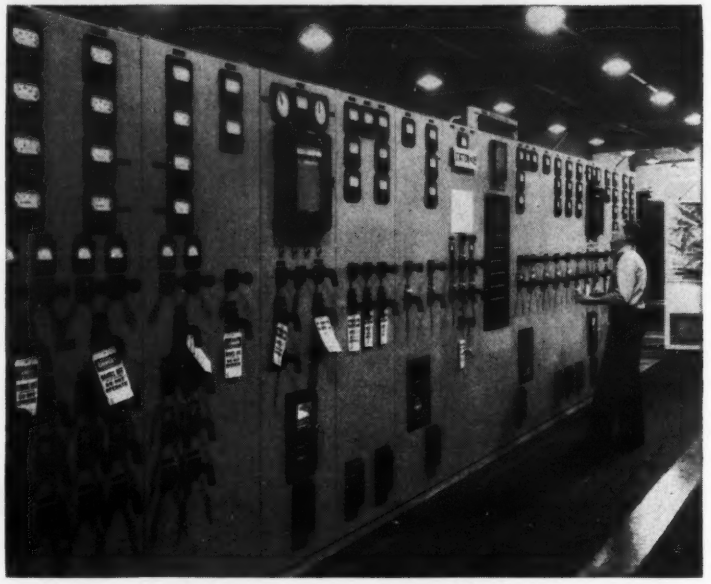
Offer two new brochures on piezo-electric materials

"Piezotronics" is the title of a 24-page brochure describing piezo-electric materials — materials that generate electricity upon being pressed or squeezed. Covered are applications for such materials.

"Piezotronics Technical Data" is the title of a 32-page brochure comparing the general properties of piezo-electric materials with other materials. Also included are tables of physical properties, and a bibliography.

for your information...

brief summaries of helpful product news



Portion of complex control panel of Muscle Shoals plant.

4 Points For Consideration In The Production of CHLORINE

Users of rayon-grade caustic and chlorine in large quantities will be interested in these four points about DeNora Amalgam Cells.

1. The problem of too much caustic. A frequently serious disadvantage of diaphragm cell production of chlorine is that equivalent quantities of dilute impure caustic must be produced simultaneously. If caustic of high quality is needed, it must be evaporated and purified at high cost. The mercury cell provides an answer to this. It not only produces directly rayon-grade caustic of high strength but permits production of materials other than caustic soda or caustic potash.

2. How pure is this caustic? Rayon-grade concentrations up to 70-73% or more have been obtained. Purity of chlorine and hydrogen is also high.

3. What is Monsanto's experience in the design and construction of chlorine plants? Monsanto has designed and engineered five successful mercury cell plants in the past four years, among them the multimillion-dollar chlorine caustic plant built for the Army at Muscle Shoals, Alabama. The DeNora Company in Italy has built several others in foreign countries.

4. What are capital and manufacturing costs? About the same as for diaphragm cells with the necessary evaporation and purification. Operation is simpler an repair expense decreased because bottom and sides of the DeNora cell are lined with a selected natural stone instead of with rubber of uncertain life. Even more important is the fact that much more of the interior of the cell is lined than in any other mercury cell. Only a small amount of bare steel is not lined and even this portion is covered by mercury at all times. No other cell has this feature.

The DeNora two-stage decomposer facilitates production of high-strength caustic and permits manufacture of caustic in one stage and some different product such as sodium sulfide in the other stage. Alternately, both stages may be used for making totally different products requiring sodium or potassium for their manufacture.

Methyl Toluenesulfonate Now Available Commercially

Methyl toluenesulfonate, a methylating agent in dyestuff manufacture, is available for the first time in commercial quantities from Monsanto.

The product is a methyl ester of a high ortho-low para mixture of toluenesulfonic acid.

It is also used in the manufacture of photographic and pharmaceutical intermediates, and as a catalyst in the preparation of alkyd resins. The chemical has a high boiling point, and consequently may be used in a system at atmospheric pressure. Send coupon for technical data sheet.

Bondite Soil Conditioner Helps To Control Erosion

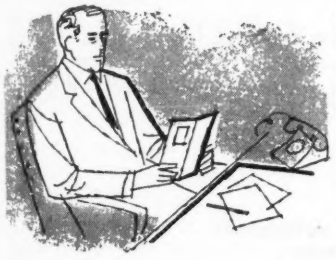
A new synthetic soil conditioner to help control wind and rain ero-

sion on construction sites, levees, rights-of-way and similar applications, has now proved its worth in a 21-state test.

According to tests of more than a year's duration carried out under a variety of soil and weather conditions, the soil conditioner is ordinarily effective at the rate of one pound or less per 100 square feet.

Sold under the trade name Bondite, this compound holds the seed and soil in place until vegetative cover crops germinate and become established.

Bondite may be applied as a powder, or in solution simultaneously with seed and fertilizer from mobile unit. When properly used is more advantageous than mulches because it is easier to apply, not flammable and will resist wind. For more information, use the coupon.



New Booklet Available On Concentrated, Soluble Fertilizers

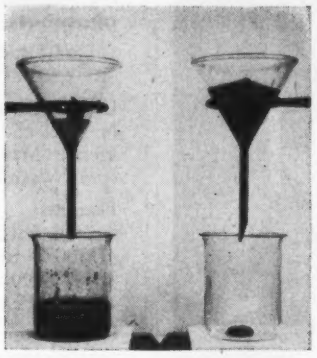
A new booklet "Concentrated Water-Soluble Fertilizers" has just been issued by Monsanto Phosphate Division.

This booklet gives valuable basic information on liquid fertilizers and presents a definitive picture on this fast-growing new field.

Concentrated, water-soluble fertilizers are rapidly increasing in popularity because they can be easily applied by hose or sprinkler, are safe to use, have minimum odor and are quickly taken up by the plant.

Monsanto supplies the ingredients, ammonium and potassium phosphates and phosphoric acid that are the basis of these fertilizers. For copy of the new booklet, mail the coupon today.

STP Aids Cement Makers



Sample on left contains STP. Both samples are shale slurry with 42% water. Note difference in viscosity.

Specially designed cart makes loading of STP easy.

Pumpability and Mechanical Handling of Slurries Improved by Using Monsanto STP as Additive

A technique for improving slurry handling recently developed by a large Midwestern portland cement manufacturer in cooperation with Monsanto shows promise of being a major processing improvement for the entire wet process cement industry.

The problem began when the cement plant encountered trouble with pumping the slurry between the mill and kiln.

Although the solution of this problem was for a particular plant with particular raw materials and operating conditions, it is felt that the technique developed, and the problem itself — the control of slurry viscosity — will be of basic interest to the entire cement industry and related industries.

During plant operation it was found that Monsanto STP (sodium tripolyphosphate) could maintain easily pumpable slurry viscosity with lower water content—and therefore increase capacity to the kiln.

To obtain the best results, shale is ground in a ball mill and STP added. The limestone is ground separately and then sent through a Dorr thickener and into the correcting basin. Here the shale slurry is added. The two slurries are blended to get the correct proportions and the mix is pumped to the kiln.

*Trade-mark

MONSANTO CHEMICALS — PLASTICS

MONSANTO CHEMICAL COMPANY 6/53
1702 South Second Street, St. Louis 4, Missouri

Please send information on: ☐ STP in Portland Cement

Please send: ☐ New Soluble Fertilizer booklet.
☐ Methyl Toluenesulfonate data sheet.
☐ Bulletin O-95 Bondite Soil Conditioner for Erosion Control.

Name ..... Title .....
Company .....
Street .....
City ..... Zone .... State .....

When inquiring check CP 1677 on handy form, pgs. 2-3

ties of piezo-electric materials. Basic behavior and electrical, mechanical, electro-mechanical, and circuit data are provided. Brochures are issued by the Brush Electronics Company, Dept. CP, 3405 Perkins Avenue, Cleveland 14, Ohio. When inquiring specify CP 1678 on handy form, pages 2 and 3.

Tensile strength retention of treated fabric shown in soil burial tests . . .

zinc bactericide-fungicide looks more effective than conventional solubilized Cu-8-Q

Uses: For protection against micro-organisms — rot, mildew, etc. — in textiles, vinyls, rubber and rubberized fabrics, adhesives, coatings, latex paints, and veneers.

Features: Maker reports this product to be the most potent addition to his line of Phenamins (see article on page 20 of the May '53 issue of CHEMICAL PROCESSING).

No chlorine is released from the product because it is a chlorine acceptor . . . thus there is no tenderizing of fibers, fabrics, vinyls, rubber, etc. For same reason, the product is not phytotoxic to plants in agricultural uses. In addition, it has an antioxidant factor that enhances color stability and prevents aging of fabrics.

Description: Phenamin Zinc Super is a complex salt of zinc pentachlorophenate and alkyl-N-propyldiamine, wherein the zinc pentachlorophenate is converted into a solubilized form. Two forms of the product are available: Phenamin Zinc Super, organic dispersible, and Phenamin Zinc Super W.E., water emulsifiable. Active ingredients are 50% for each product, and available metallic zinc is 5% min.

Following tabulation is the result of soil burial tests made by an independent laboratory, pointing up the comparative fungistatic and bacteristatic action of the product. Tests were made on twill cloth, impregnated with the indicated product, then subjected to a 2-week's soil burial test (US Army Spec JAN-D-504) after leaching in synthetic perspirant for 24 hours.

Impregnant	Tensile Strength Retention
Conventional solubilized copper-8-quinolinolate (0.3% Cu as metal)	control
Phenamin Zinc Super (0.5% Zn as metal)	17% improvement over control
Phenamin Zinc Super W.E. (0.5% Zn as metal)	16% improvement over control

Product is available as a 50% active material in dioctyl phthalate for compatibility with resins.

(Products of By-Products Processing Laboratories, Inc., Dept. CP, 42-17 27th Street, Long Island City 1, New York . . . or reader may secure more information by simply checking CP 1679 on convenient Reader Service slip between pages two and three.)

Dependable Source of Chemical Raw Materials

Albert Ruth, President, New Bedford Rayon Company (right), discusses plans with Peter A. Green, Vice President (center), and Wyandotte Representative John H. Bahlburg.

"Our plans call for Wyandotte Caustic exclusively," *says Albert Ruth, New Bedford Rayon Co.*

"Rayon is man-made through chemical control," says Albert Ruth, president, New Bedford Rayon Co., New Bedford, Mass. "Obviously, quality and uniformity of raw materials, care and ingenuity in processing and development make the best rayon.

"We've tested caustics from many sources and have found Wyandotte Mercury Cell Caustic consistently high in quality and more uniform. Wyandotte has been very cooperative, too. Wyandotte Technical Service, for example, is always ready to work with us on any problem, large or small.

"Wyandotte is one concern that believes in service to the customer, and practices that belief. We like this attitude and consequently use Wyandotte Mercury Cell Caustic Soda exclusively."

You can put your trust in Wyandotte Mercury Cell Caustic. It's as pure as a reagent grade — needs no further purification in your plant. Wyandotte Caustic is shipped in up-to-date engineered tank cars . . . each tank-car of caustic is completely protected from iron pick-up by Wyandotte's "MA-4" - rubber lining.

Send for Wyandotte's helpful, new 56-page book on Caustic Soda. It contains data on grades best suited for your requirements — whether for rayon, pulp and paper, soap and syndets, textiles, chemicals, oil and lubricants, paints, dyes, metals. It also gives complete data on manufacturing processes, purity, analytical methods, and contains tables and charts on chemical reactions. It's free for the asking! Write to *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

Wyandotte
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CHEMICALS
HEADQUARTERS FOR ALKALIES
Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
Calcium Carbonate • Calcium Chloride • Glycols • Synthetic
Detergents • Agricultural Insecticides • Soil Conditioners
Other Organic and Inorganic Chemicals

When inquiring check CP 1680 on handy form, pgs. 2-3

Tanks, spray washers ok for application of phosphate coat . . .

salt spray resistance of treated painted parts exceeds government specification

Uses: Creates a complex zinc phosphate coating on steel and iron to promote adhesion of paint to metal. May be used in tanks as well as in pressure spray washing machines.

Features: Salt spray resistance of painted parts treated with the compound exceeds the requirements of the following government specifications: JAN-C-490, Grade I; 57-0-2C, Type 2, Class C; and PA-PD-191 Rev. A.

Description: CrysCoat HC provides a coating that is crystalline in nature and has a weight ranging from 200 to 1200 mgm/sq ft, depending upon application and the type of steel being treated.

An outstanding feature of the product is that sludging and scaling are minimized. In addition, all-stainless steel tank set-ups are not necessary. Another advantage of the material is simplicity in application — CrysCoat HC is the only agent involved. No special additives or toners are needed. Upkeep of solution is determined by a simple titration procedure.

(Product of Oakite Products, Incorporated, Dept. CP, 118F Rector Street, New York 6, New York . . . or for more information check CP 1681 on handy form, pages 2 and 3.)

Outlines use of detergents in mixed fertilizers

Informative, 4-page bulletin is a summary of techniques which have been used to incorporate manufacturer's detergents in ammoniated mixed fertilizers. Two forms of detergent which are recommended give instantaneous solution in low moisture materials, permitting use with no change in customary operating procedures and time schedules. Advantages and techniques of using detergents in this process are outlined in detail.

Bul 53 is issued by Universal Detergents, Inc., Dept. CP, 1825 E. Spring St., Long Beach 6, Calif. When inquiring specify CP 1682 on handy form, pages 2 and 3.

Prevents paints from skinning without interfering with drying

Uses: Anti-skin agent for paints, varnishes.

Features: Reported to be so volatile and so free from ends that it evaporates from the film right along with the thinner — thus offering no interference with drying action.

Description: Nilskin is a synthetic chemical product. There is said to be no chemical reaction

between it and the paint or varnish. It has no unpleasant odor itself and develops no unpleasant odor during storage. Nilskin does not stain whites, will not cause tints and pure colors to go off-shade in the can, nor does it cause color changes during baking. Gelation is not caused with its application. Physical properties are set forth below:

Color	light straw
Specific gravity	0.85-0.853
Lb/gal	7.00
Volatility	98% distills below 160°C
Mineral spirits tolerance	infinite
Acid number	less than 1
Moisture	0.5% max

(Development of Naftone, Inc., Dept. CP, 515 Madison Avenue, New York 22, New York . . . or for more information check CP 1683 on handy form, pages 2 and 3.)

Krilium now in liquid form for prevention of soil crusting

A new formulation of Krilium soil conditioner — — called Kriluim Soil Conditioner Liquid — is now available for prevention of soil crusting in agriculture. As indicated, the product is a liquid and was specifically formulated for crust control in surface application by growers of row crops. It in no way replaces or duplicates the powder forms of Krilium.

Liquid form eliminates the tedious and previously necessary job of dissolving a powder or flake form material in water.

Carefully supervised tests, under field conditions, have shown that use of the product stabilizes many types of soils against slaking, sealing, and crusting. Secondary benefits from this stabilization include improved germination and emergence of seedlings, and improved water penetration in treated areas.

Product is applied directly to the surface of the cultivated soil, at time of seeding, with conventional spray equipment at pressures of 20 to 40 psi. Equipment necessary for spray application can be easily mounted on tractors or other mobile units used in planting operations.

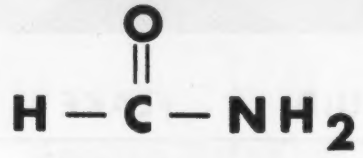
(Product of the Monsanto Chemical Company, Dept. CP, St. Louis 4, Missouri . . . or for more information check CP 1684 on handy form, pages 2 and 3.)

80 pages offer help to picklers

"Efficient Pickling with Rodine" is the title of an 80-page, profusely illustrated bulletin offered to iron and steel picklers. Rodine is a selective inhibitor preventing excessive attack on metal during the removal of mill scale during pickling operations.

Helpful Bul 13 is issued by the American Chemical Paint Company, Dept. CP, Ambler, Pennsylvania. When inquiring specify CP 1685 on handy form, pages 2 and 3.

AN IDEA-CHEMICAL FROM DU PONT



FORMAMIDE

SOLUBILITY DATA

Completely miscible with water, methanol, ethanol, acetone, acetic acid, dioxane, ethylene glycol, glycerol, and phenol.

Very slightly soluble in diethyl ether and benzene.

Dissolves a number of inorganic salts, including the chlorides of copper, lead, zinc, tin, cobalt, iron, aluminum and nickel; the acetates of the alkali metals; and certain sulfates and nitrates.

Dissolves casein, gelatin, animal glue, glucose, zein, tannin, starch, lignin, polyvinyl alcohol and cellulose acetate.

Has softening action on cellulose and cellulose nitrate.

IMPORTANT CHEMICAL PROPERTIES

Reacts with alcohols on heating to give formic esters and ammonia.

Can be dehydrated catalytically to form hydrocyanic acid.

Forms methylol derivative with formaldehyde.

Here's a versatile solvent and useful intermediate you should investigate

Du Pont Formamide, available with 97.0% minimum Formamide content, is a clear, viscous liquid with a faint odor of ammonia and a boiling point of 210° C. A useful chemical in a wide range of industries, Du Pont Formamide is an economical and efficient solvent for many heavy metal chlorides and other inorganic salts . . . for a variety of organic compounds including acetic acid, phenol, gelatin, lignin, glucose and cellulose.

In addition to its solvent properties, Du Pont Formamide is a useful intermediate in vitamin synthesis, finds application in the manufacture of formic and hydrocyanic acids, and is used as a softener for animal glues and paper.

Why not investigate the use of Du Pont Formamide in your business? We'll be glad to send you more information on this versatile chemical—specifications, properties, suggested uses, etc. Just clip the coupon below or write on your letterhead to E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Wilmington 98, Del.

GRADE AND AVAILABILITY: Du Pont Formamide, available with 97.0% min. Formamide content, is shipped in tank cars and 55 gallon non-returnable steel drums (net. wt. 500 lbs.).

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CHEMICALS • PLASTICS

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Department 586, Wilmington 98, Delaware

Please send me more information on Du Pont Formamide—specifications, chemical and physical properties, suggested uses, bibliography, etc. I am interested in evaluating Formamide for the following applications:

_____

_____

Name_____ Title_____

Firm_____

Address_____

City_____ State_____

When inquiring check CP 1686 on handy form, pgs. 2-3

Hooker Chemical Guide
(ONE OF A SERIES)
USE this handy reference to save time in selecting high quality chemicals.

HOOKER CAUSTIC SODA

50% LIQUID	FLAKE
73% LIQUID	SOLID

Used in these products and processes:

wood pulp
soap
glass
chemical intermediates
phenol
resorcinol
naphthol
oxalic acid
indigo
sodium salts
pigments
aniline dyes
ceramics
pharmaceuticals
cosmetics
viscose rayon
cleaning compounds
reclaiming rubber
mercerizing cotton
reclaiming tin
food processing
reclaiming paper
metal ore refining
bleaching textiles
petroleum refining
dyeing textiles
engraving
printing textiles
lithography
water softening
and many, many others

DEPENDABLE DELIVERIES

When you order chemicals from Hooker, you know that you are dealing with a reputable, dependable supplier. You can count on prompt deliveries, timed to fit your production schedule.

GROWING...TO SERVE YOU BETTER

New Chicago Office—To better serve Midwestern chemical users, Hooker has recently opened an office at 1 North LaSalle Street in the heart of Chicago's Loop. Midwestern users need only call Chicago, CEntral 6-1311, to receive fast shipment from the main plant at Niagara Falls. Hooker technical personnel will also be stationed at the Chicago office to assist you with your chemical requirements.

New plant at Montague, Michigan—In addition to the existing plants at Niagara Falls and Tacoma, Hooker is building a plant at Montague, Michigan which will increase chlorine and caustic soda production by 100,000 tons per year. Construction will be completed in 1953. This plant will further speed deliveries to Midwestern users.

Research and development—Over 100 regular products, and many more research products, have been made available through Hooker's specialized experience in chlorination, hydrogenation, esterification, sulfhydration, hydrochlorination, and fluorination. Complete laboratory and pilot plant facilities are ready to serve you.

Products available now—Chlorine, muriatic acid, sodium sulfide, chlorobenzenes, and many other products are available for immediate shipment. For full information, write on your letterhead to *Hooker Electrochemical Company*, 15 Forty-Seventh Street, Niagara Falls, N. Y.

From the Salt of the Earth

HOOKER ELECTROCHEMICAL COMPANY
NIAGARA FALLS • TACOMA • NEW YORK • CHICAGO • LOS ANGELES

HOOKER CHEMICALS 2-1932

When inquiring check CP 1687 on handy form, pgs. 2-3

Offer alkyd manufacturers pure fatty acid . . .

for tough, flexible, non-yellowing baking finishes

Uses: Pure fatty acid with low unsaturated fatty acid content (less than 1%) offered to alkyd manufacturers for formulating high-bake enamels.

Features: Properly formulated, applied, and baked enamels are non-yellowing, are clear and hard, have high flexibility, and have good adhesion.

Description: Neo-Fat 280 is a combination capric-myristic fatty acid. Alkyds made from the product show good resistance to greases, oil, conventional soaps, solvents, and similar materials. Raw materials included in a typical non-oxidizing alkyd formulation are:

	Percent by Weight
Neo-Fat 280	29.3
Phthalic anhydride	43.0
Glycerol, C.P. (18% excess)	27.7
	100.0

(Product of Armour Chemical Division, Armour & Company, 1355 W. 31st Street, Chicago, Illinois . . . or for more information check CP 1688 on handy form, pages 2 and 3.)

Formulations, specifications for derivatives of tall oil

Informative 24-page bulletin tabulates formulation and performance data for various derivatives of refined tall oil, used as protective coatings. In addition to formulation directions, bulletin lists typical constants, film characteristics, compatibility information and suggested uses for such esters as sorbitol-pentaerythritol, pentaerythritol, high-maleic pentaerythritol, medium short rosin-modified glycerol phthalate alkyd and various extended-modified esters.

Data Sheet 11 is issued by Union Bag & Paper Corp., Dept. CP, 233 Broadway, New York 7, N. Y. When inquiring specify CP 1689 on handy form, pages 2 and 3.

Add three new phenolics to high-impact line of molding compounds

Excellent molding performance, fast cure, good surface, outstanding electrical properties, and stability in storage are the attributes of a new line of high-impact phenolic molding compounds. Available in natural and black color, compounds meet the requirements of existing specifications. Addition of the compounds is meant to supplement maker's current line of general-purpose, heat-resistant, and high impact strength phenolics. Three types are available:

1) Synvar PM-88502 Natural and Synvar PM-88512 Black—with impact of 0.6-1.0 ft lb/in of notch.
2) Synvar PM-88500 Natural and Synvar PM-88510

Black—with impact of 1.0-2.0 ft lb/in of notch.
3) Synvar PM-88501 Natural and Synvar PM-88511 Black—with impact of 2.0-3.0 ft lb/in of notch.

(Products of the Synvar Corporation, Dept. CP, Wilmington, Delaware . . . or for more information check CP 1690 on handy form, pages 2 and 3.)

Putting Teflon to work — new catalog out

Latest technical data on Teflon is available in an 8-page catalog. Applications and possibilities for the material are described in detail, along with Teflon's outstanding properties and characteristics. Included are a complete set of tables, charts, and sketches. A special summary deals with design considerations. Cataloged are such forms as rod, tubing, slab, and tape — with specifications on size, shape, and tolerance.

Teflon Catalog is issued by The Polymer Corporation of Pennsylvania, Dept. CP, Reading, Pennsylvania. When inquiring specify CP 1691 on handy form, pages 2 and 3.

Cure of rubber stocks not retarded with coated carbonate . . .

ultrafine product disperses readily without special handling; eliminates masterbatching

A new coated ultra-fine calcium carbonate is said to disperse in rubber stocks without special handling and to eliminate masterbatching. Paramount aspect of the coating is that it in no way retards cure.

Purecal SC even has advantages in GR-S rubbers where uncoated ultra-fine carbonates are usually successful. In cases where dispersion has been a problem, however, Purecal SC appears to be the answer. Ordinary factory methods may be employed with the coated product.

(Development of the Wyandotte Chemicals Corporation, Dept. CP, Wyandotte, Michigan . . . or for more information check CP 1692 on handy form, pages 2 and 3.)

Information on uses, properties of water soluble natural gum

Physical and chemical properties, origin and mesh specifications for widely used natural gum, Gum Arabic, are outlined in informative, 4-page bulletin. Comparisons are made with other water soluble gums and between the 4 exudation gums. Suggested uses in drugs, chemical specialties, coatings and sizings are presented in addition to information on preparation of solutions, moisture characteristics and recommended preservatives.

Bul G-101 is issued by Morningstar Gum Dept., Morningstar, Nicol, Inc., Dept. CP, 630 W. 51st St., New York 19, N. Y. When inquiring specify CP 1693 on handy form, pages 2 and 3.

Sodium Tripolyphosphate

Tetrasodium Pyrophosphate
ANHYDROUS

Sodium Polyphos
(SODIUM HEXAMETAPHOSPHATE)
(SODIUM TETRAPHOSPHATE)

Trisodium Phosphate
CRYSTALLINE
MONOHYDRATE

Sodium Phosphates BLOCKSON

Chlorinated
Trisodium Phosphate

Disodium Phosphate
ANHYDROUS
CRYSTALLINE

Monosodium Phosphate
ANHYDROUS
MONOHYDRATE

Sodium Acid Pyrophosphate

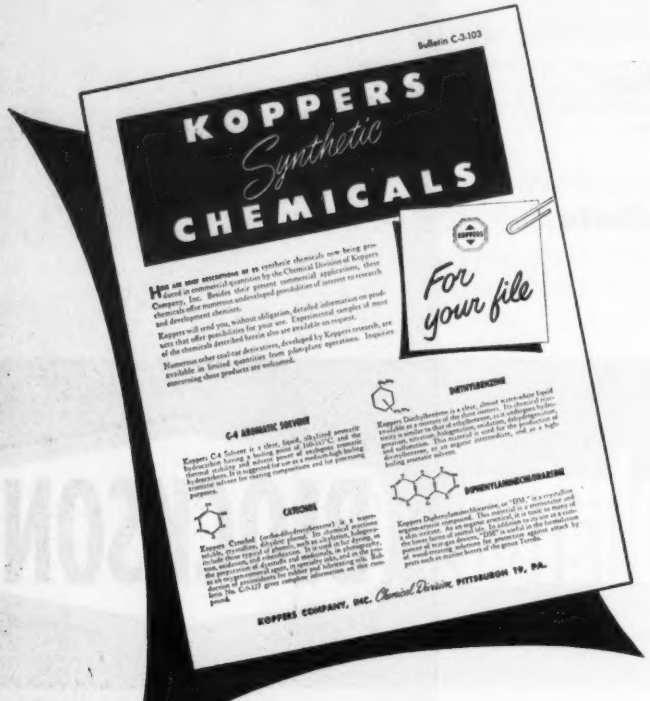
also major producers of: SODIUM FLUORIDE
SODIUM SILICOFLUORIDE
HYGRADE FERTILIZER

BLOCKSON CHEMICAL COMPANY • JOLIET, ILLINOIS

When inquiring check CP 1694 on handy form, pgs. 2-3

For You—

The latest information on KOPPERS Synthetic CHEMICALS



C-4 Aromatic Solvent
Catechol
Diethylbenzene
Diphenylaminechlorarsine
Di-tert-BUTYL-para-CRESOL
Divinylbenzene
Ethylbenzene
Impruvol 20®
Impruvol 33®
"KTPL" Resins
beta-Methyl Umbelliferone
Penacolite® Adhesives
Phthalic Anhydride
Polystyrene Emulsions
Potassium Cyanide
beta-Resorcylic Acid
Resorcinol
Sodium Cyanide
Sodium Sulfite
Styrene Monomer
Sulfuric Acid
Polystyrene

● Bulletin C-3-103, shown here, lists the properties, reactions and uses of 22 synthetic organic chemicals produced by Koppers Chemical Division. Most of these chemicals have established commercial applications, and in addition, offer rich, new fields of investigation to research and development chemists. The Bulletin describes all 22 of the products listed above.

WRITE NOW FOR YOUR FREE COPY.

KOPPERS® Koppers Chemicals

KOPPERS COMPANY, INC.
Chemical Division, Dept. CP-63, Pittsburgh 19, Pa.

When inquiring check CP 1695 on handy form, pgs. 2-3

"Softened" textiles resist dry cleaning, washing

Uses: Produces a soft, silky hand on acetate, viscose, nylon, and other synthetic fibers.

Features: Reported to improve the cutting and laying up properties, and helps to control static elecricity. Resists dry cleaning and washing when applied either in the dye beck as a final rinse or by pad.

Description: Ampitol 35D is a substantive softener, cationic in nature. It has low foam in high-speed pad operations, is readily soluble in water at 130°F (and above), and compatible with starch, dextrines, gums, and similar substances.

Product is not compatible with anionic agents such as soap, sulfated oil, etc. It is not to be used in strong alkaline solutions. The pH of a 0.1% solution at 25°C is 4-4.5.

Formula: In the dye beck as a final finish, apply ¼ to 1% Ampitol 35D on weight of the goods as a final rinse for 10-20 min at 110-130°F. For padding, use ⅜-1 oz per gallon of pad liquor.

(Product of the Dexter Chemical Corporation, Dept. CP, Boulevard P.O. Box 1, New York 59, New York . . . or for more information check CP 1696 on handy form, pages 2 and 3.)

Metallic soaps as gelling agents

"Metallic Soaps as Gelling Agents for Plastigels" is the title of an article written to fill the demand for information on the relative effectiveness of the various metallic soaps as gelling agents. Full descriptions of the procedures followed, as well as data obtained, are given in the text and in the form of graphs. Comment is also made on the stabilizing properties of each soap.

Copies of article are issued by the Witco Chemical Company, Dept. CP, 260 Madison Avenue, New York 16, New York. When inquiring specify CP 1697 on handy form, pages 2 and 3.

Thymidine may help to solve cancer riddle . . .

now being produced in commercial quantities to foster cell studies

Thymidine, an important chemical for medical research, is now being produced in commercial quantities for the first time. It is one of the building blocks for the formation of desoxyribonucleic acid, a growth regulating factor in all living cells. School of thought now is that improper formation of the nucleic acid may be responsible for wild growth of cells — cancer. Information on how thymidine is incorporated into the larger molecule will help to solve the riddle of cancer.

Till now, only a fraction of an ounce of thymidine has been isolated. For some bacteria, it can replace the essential growth factors — vitamin B_{12}

SPECIFY
EL DORADO
COCONUT OIL
FATTY ACIDS
FOR
PURITY
UNIFORMITY
SERVICE

SERVICE ON DELIVERIES

Your order . . . whether a tank car or a drum . . . reaches you *when you want it.* El Dorado keeps stocks in New York, Chicago and San Francisco areas . . . ready to go when you want service. And El Dorado is geared to meet short deadlines.

SERVICE ON INFORMATION

What do you want to know about coconut oil fatty acids? Specifications? Availability? Market information? Costs? Shipping information? How to get better processing results? Ask El Dorado.

WRITE OR CALL:

IN THE ATLANTIC STATES:
H. Reisman Co.
27 William Street
New York, N. Y.

IN THE MID-WEST:
Arthur C. Trask & Sons
4103 South LaSalle Street
Chicago, Ill.

IN THE WEST:
El Dorado Oil Works
311 California Street
San Francisco, Calif.

FATTY ACIDS
Coconut • Caprylic • Capric • Lauric
Myristic • Palmitic • Eldhyco

METHYL ESTERS
Caproate • Caprylate • Caprate • Laurate
Myristate • Palmitate • Coconate • Eldo 18

FOR SAMPLES AND INFORMATION, WRITE DEPT. ——

EL DORADO OIL WORKS SINCE 1882

311 California Street, San Francisco, Calif.
Plants in Bayonne, N. J., and Oakland, Calif.

When inquiring check CP 1698 on handy form, pgs. 2-3

and folic acid, useful in treating human anemias. Now that the supply of the compound permits extensive studies, thymidine may at some later date share a place with vitamin B_{12} and folic acid as a therapeutic agent and nutritional factor for humans and domestic animals.

(Product of Schwarz Laboratories, Inc., Dept. CP, Mount Vernon, New York . . . or for more information check CP 1699 on handy form, pages two and three.)

Give comprehensive info on plastic materials

One informative brochure and three pertinent data sheets outline descriptive information regarding characteristics, applications and specifications of two plastic materials and their many forms. Special emphasis is placed on available forms of these materials for use in a variety of manufacturing operations.

Four-page, descriptive brochure — "Dixon Plastics for Modern Engineering" — gives information on Rulon bearing material and its applications and forms; Teflon, a tetrafluoroethylene resin, its applications and available forms; and Teflon DL-1, a pure Teflon for low cost requirements in applications where many characteristics of parent material are required, but with some characteristics at a lower specification level.

"Teflon-Plus" outlines manufacturer's experience using Teflon in combination with various filler materials. Convenient table summarizes various filler materials which have been employed in mixtures with the plastic.

Various special items fabricated of Teflon are listed in data sheet entitled "What's New in Teflon". Forms of material discussed include extruded beading, extruded spaghetti tubing, extruded tape, molded sheets and molded porous shapes.

Essential data on Rulon, a low-friction bearing material, is presented in 2-page data sheet. "Friction, Abrasion and Hardness of Rulon" summarizes information regarding various characteristics of material in handy tables.

Brochure and data sheets are issued by Dixon Saddle Co., Dept. CP, Bristol, R. I. When inquiring specify CP 1700 on handy form, pages 2 and 3.

No "dead-end" articles . . .

in fact, every article leads into two avenues of contact. First, we do publish at the end of all articles the names and complete addresses of companies who can give you specific information so that you can write direct. Or, there's the handy Reader Service slip which you can check and send to us.

THE EDITORS

Since 1900, Paterson Parchment Paper Company has used Glycerine to plasticize its Patapar Vegetable Parchment for packaging foods such as butter, margarine, shortening, pie mixes, fish, meats, poultry, celery, ice cream and frozen foods. More recently, Doughnut Corporation of America's famous biscuit and muffin mixes are Patapar-wrapped. Patapar has high wet strength and grease resistance. It must also be pliable. For over fifty years, Paterson Parchment Paper Company has used Glycerine to assure this pliability.

The plasticizing and moisture-retaining action of Glycerine adds an important "plus" to vegetable parchment, and to other widely used packaging materials. It contributes the softness and pliability essential in wrapping and bag forming.

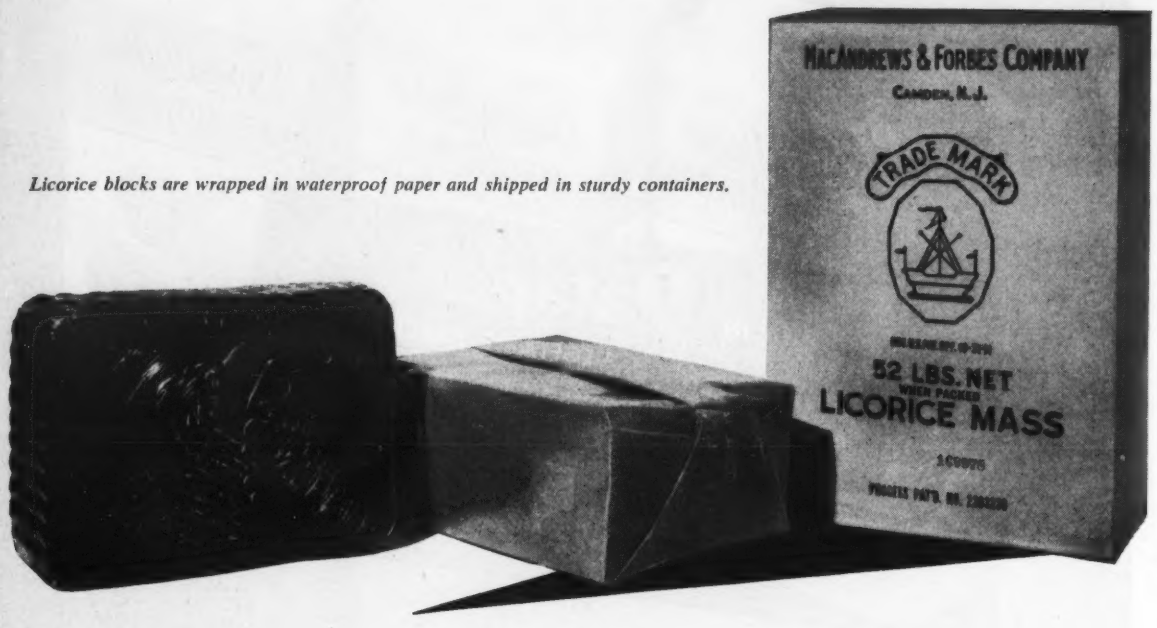
And, of course, a food packaging material must not contain any materials unsafe for use in contact with food. Here again, Glycerine is the ideal answer. It has a long-time record of acceptance, not only in food wraps, but in food products themselves. In fact, it has food value in its own right.

Applications of U. S. P. Glycerine in food processing—as a humectant, sweetener, solvent, plasticizer—have been accepted by the American Medical Association Council on Foods, and permitted by Federal and State food and drug authorities.

For a copy of "Why Glycerine for Foods?" a handy 16-page booklet on Glycerine's unique range of properties and applications, write Glycerine Producers' Association, 295 Madison Ave., New York 17, N. Y.

Nothing takes the place of Glycerine

When inquiring check CP 1701 on handy form, pgs. 2-3



Licorice blocks are wrapped in waterproof paper and shipped in sturdy containers.

***LICORICE** has challenging industrial possibilities*

Has licorice any value in the treatment of Addison's disease? Can it be used to enhance the flavor of breakfast foods? Might the active enzymes of licorice root be useful in the control of digestive or nutritional functions? And what could it do for your business?

Medical studies recently completed indicate a *yes* to the first question. *It's likely* would be the reply to the food manufacturer who failed to solve his problem with more familiar flavor components. *Don't know* would be the answer to the third query—almost anything, it seems, can happen with licorice. The fourth: at this moment, a question mark!

Centuries ago someone introduced a new, flavorful candy by adding licorice to his recipe. Pharmacists also started using licorice extract to mask the bitterness of certain medicines. More recently, extract of the "sweet root" came to be employed as a conditioner and mellowing agent in tobacco products. Next, experiments revealed that licorice helps produce a tough foam structure, one that has been put to valuable service in extinguishing fires.

The listing at the right still further suggests that you should not overlook licorice in your search for new products or for ways to improve what you are already making. We don't have all the answers, but we do have the licorice and the licorice derivatives, plus the know-how, to help you find them.

Some New or Potential Uses for Licorice And Licorice Derivatives

Flavor for ice cream • Antioxidant to keep chewing gum fresh • Prolonging foam in porter and ale • Soft drink flavor • Aging and mellowing smoking pipes • Improving meat and fish sauces Therapeutic agent in treatment of Addison's disease • Component in feeds for horses, cattle and chickens • Soothing ingredient in cough syrups • Stabilizing acid latex • Flotation agent in ore separation

Write today for your free copies of "The Story of Licorice" *and* "Licorice: Dark Mystery of Industry." *They'll be mailed promptly. You're sure to find them interesting, and you might find them profitable as well.*

MACANDREWS & FORBES COMPANY
Licorice and Licorice Products • Since 1870
200 Fifth Avenue, New York 10, N.Y. ***Plant:*** **Camden, New Jersey**

When inquiring check CP 1702 on handy form, pgs. 2-3

Mono- and diglycerides natural, require no extended tests

Positive demonstration that large quantities of naturally occurring mono- and diglycerides occur during normal digestion of fats by animals makes further programs of extended toxicity tests, on these substances unnecessary, according to a report of the National Research Council.

This report, "The Safety of Mono- and Diglycerides for Use as Intentional Additives in Foods," was issued recently by the Food Protection Committee, Food and Nutrition Board of the Council. On the basis of tests, the committee states, "It is reasonable at this time to assume that as much as 30 to 50 grams of mono- and diglycerides per day may be formed during digestion of 100 grams of ingested fat."

About a gram of these substances per day is consumed by persons eating natural food fats, and an additional one or two grams might be consumed as a result of their formation during baking and cooking of processed foods.

"It appears," the report continues, "that the maximum amount of mono- and diglycerides intentionally added to all foods cannot be expected to exceed approximately 2 gm/person/day . . . . The additional amounts which may be intentionally added to foods are not large enough to raise the consumption to levels significantly higher than normal."

The Food Protection Committee expects to release reports later concerning other types of emulsifiers.

For more information on Mono- and Diglyceride Report, write National Research Council, Food and Nutrition Board, 2101 Constitution Ave., Washington 25, D. C.

Temperature and stress resistance advantages of lubricants . . .

products stand up against wide temperature ranges and prolonged stresses

Two lubricants announced are reported to withstand the effect of varying temperatures and stresses for long periods. Products display excellent lubricating and adhesive properties, according to manufacturer.

Main use of first product, known as Plastilube, is for lubrication of bearings where temperatures vary from below freezing to more than 500°F. Lubricant is a stable chemical compound without a soap base, has great adaptability to stress, will not break down or melt. It displays excellent adhesiveness in boiling water and will retain its "pumpability" at low operating temperatures.

Compound is said to fill the need for a stable lubricant for centralized systems, since breakdown or separation of lubricants in orifices, lines, and valves of centralized systems results in excessive maintenance. Use of this lubricant is reported to overcome this disadvantage.

Second product, known as Warco Open Gear Lubricant, furnishes better lubricating properties than conventional asphalt residuum base compounds, ac-

cording to manufacturer. It has greater adhesive properties and a higher melting point than other lubricants that require melting or cutting with solvents before application.

The lubricant is manufactured in a consistency that can be applied cold by hand or by paddle, won't peel off when operating at high temperatures and can be used successfully outdoors under varying climate. Consumption is reduced and cleanliness assured by elimination of "slinging" of the lube. (Courtesy of Warren Refining and Chemical Co., Dept. CP, 750 Prospect Ave., Cleveland, Ohio.)

Reclaimed aluminum meets composition specs for castings . . .

result of remelting and refining techniques — chlorine gas only fluxing agent

Use of reclaimed or secondary aluminum was, until a short time ago, prohibited for aluminum castings, die castings, and wrought products because of the chemical composition limitations that were drawn up. However, this condition no longer holds. Any aluminum ingot that can meet the chemical composition limitations is now acceptable, providing proper quality control has been maintained during melting and casting.

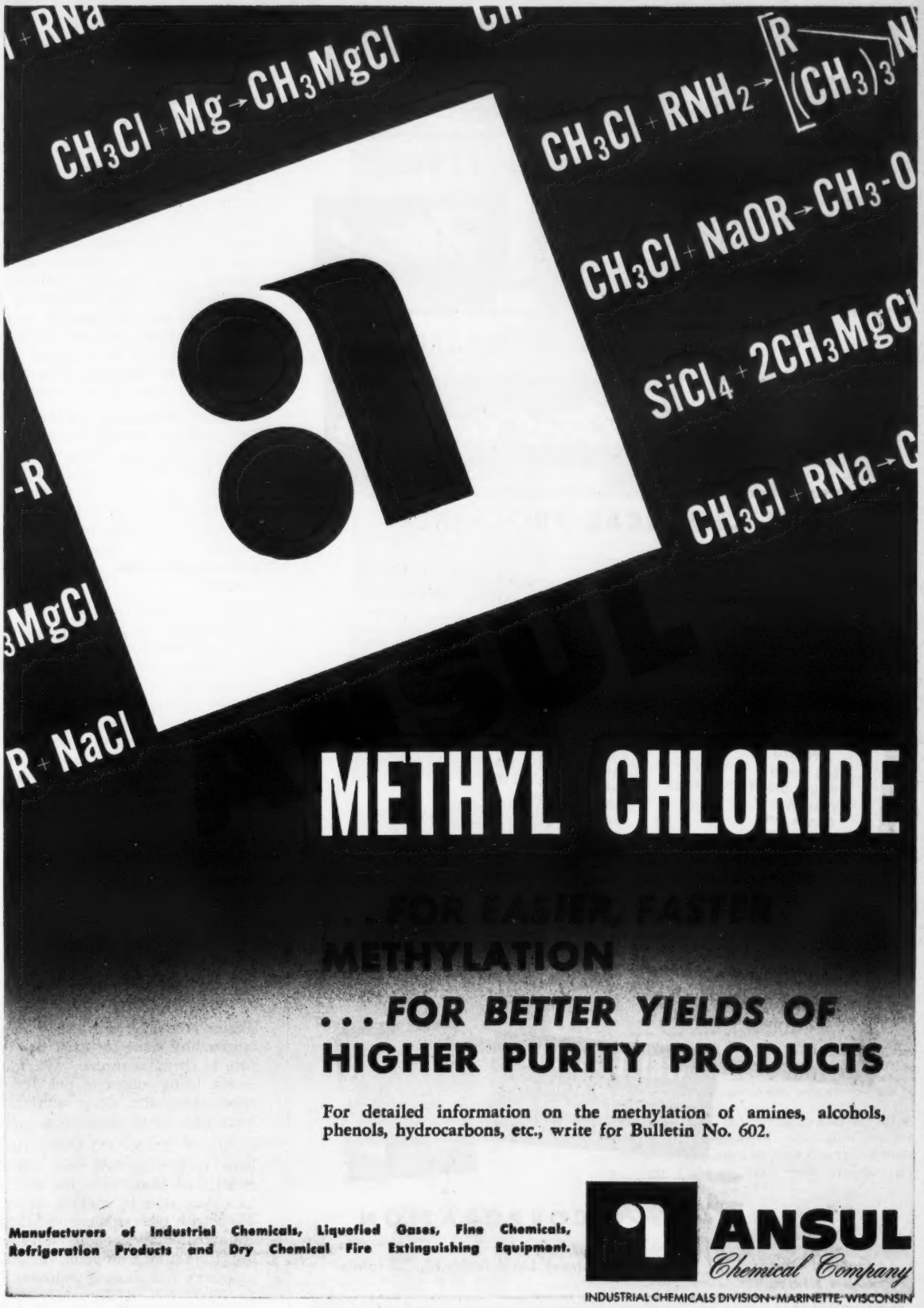
The Louisville, Ky., Plant 5 of the Reynolds Metals Company has developed and perfected remelting and refining techniques that make available secondary aluminum ingot whose quality and analyses ranges are within those specified for the original metal that went into the product melted down. For example, metal meeting the impurity limits of 17S and 24S can be had from wrecked aircraft.

The following tabulation gives the process innovations in brief:

RECLAMATION OF AIRCRAFT ALUMINUM

Conventional Practice	Reynolds Practice
1) Cut up scrap into small sections for charging.	1) No cutting; charges complete fuselage and wing sections if these are encountered.
2) Segregates lead, copper, iron, brass, and other alloys by hand.	2) Does not segregate anything by hand; melting practice takes care of impurities.
3) Charges small pieces, largely by hand.	3) Charges everything mechanically in large batches.
4) Uses granular fluxing materials such as aluminum chloride charged under bath surface by hand. Fluxes at intervals.	4) Uses chlorine gas (Pennsalt) exclusively for fluxing. Fluxes continuously.
5) Considerable metal lost by burning in the furnace. Much dross and skimmings produced.	5) Little metal lost by burning; over 95% recovery of aluminum content.
6) Poor quality metal, high in undesirable elements, which requires sweetening with virgin metal before use.	6) Excellent quality metal for foundry castings, forge, or rolling mill ingots by simple remelting additions.

(Information received from the Reynolds Metal Company, Inc., Dept. CP, Louisville 1, Kentucky.)


METHYL CHLORIDE
. . . FOR EASIER, FASTER METHYLATION
. . . FOR BETTER YIELDS OF HIGHER PURITY PRODUCTS
For detailed information on the methylation of amines, alcohols, phenols, hydrocarbons, etc., write for Bulletin No. 602.
Manufacturers of Industrial Chemicals, Liquefied Gases, Fine Chemicals, Refrigeration Products and Dry Chemical Fire Extinguishing Equipment.
ANSUL Chemical Company
INDUSTRIAL CHEMICALS DIVISION • MARINETTE, WISCONSIN

When inquiring check CP 1703 on handy form, pgs. 2-3

FOR **CHEMICAL** PROCESSES

FOR **CHEMICAL** PROCESSES

FOR **CHEMICAL** PROCESSES

Carloads of Filtrol catalysts are being used daily. Typical applications are—polymerization, esterification, oxidation, condensation, isomerization, alkylation, dehydration, hydrogenation, cracking and other chemical reactions.

PROPERTIES OBTAINABLE IN FILTROL CATALYSTS

Property	Range
Bulk Density	from 25 lbs. to 80 lbs. /cu. ft.
Particle Density	from 1.0 to 1.8 g. /ml.
Pellet Sizes	from 1/16 inch to 1 inch
Granule Sizes	from 4 to 60 mesh
Powder Sizes	from 10% to 50% 0-20 micron
Surface Area	from 50 to 500 sq. meters per gram
Water Content	from 4% to 22%
Attrition Resistance	from medium to very high
Porosity	from 0.3 to 0.6 pore volume ml. /gm
Promoters Impregnation	from non-impregnated to highly impregnated
Activity	from specific high or low to non-specific high or low

If you have a chemical problem, be sure to evaluate Filtrol products—complete technical service at your command.

WRITE TODAY for your copy of the new Filtrol pamphlet, which may suggest many uses to you.

Filtrol* **CORPORATION**

Chemical Division

General Offices: 727 West Seventh Street, Los Angeles 17, California

*T.M. Reg. U. S. Pat. Off.

The World's Largest Manufacturers of Catalysts, Adsorbents, Desiccants and Other Chemically Treated Materials

When inquiring check CP 1704 on handy form, pgs. 2-3

Solvent resistance of strippable coating for plastics . . .

is big advantage in general cementing, machining, bonding, painting operations

Several applications have been found for CD Strip A — coating for plastics — since its introduction to the field. It has proved to be a good barrier against solvent penetration and is being used for the protection of plastic canopies and windows during paint removal, painting, and de-greasing operations. It can be applied by dip, brush, or spray and sets to a gel 2-3 minutes after application. It does not craze Lucite or Plexiglas windows, and can be stripped off readily. Good resistance to following solvents is shown: toluol, methylene chloride, and similar common solvents.

Another interesting application is the protection of products during cementing, machining, and general bonding. Several products are coated with CD Strip A immediately after their manufacture. In some cases, the product is shipped, and the coating is not removed until the article has been assembled by the prime contractor in a distant location. During the entire period, it gives positive protection against scratching and solvent crazing.

It has also been used as a mask during cementing. The surface to be protected is coated with CD Strip A, then when the article is dry it is immersed in cement and finally joined together. Excess cement while still wet is scraped onto the protective coating. CD Strip A and the excess cement are removed by stripping away in one piece when desired. Articles of good appearance and high strength are possible because only the surface to be bonded comes in contact with the cement.

(Product of the Chemical Development Corporation, Dept. CP, Danvers, Mass. . . . or for more information check CP 1705, pages 2 and 3.)

Filling of Teflon yields variety of versatile compositions . . .

that are less costly than pure resin and have improved mechanical properties

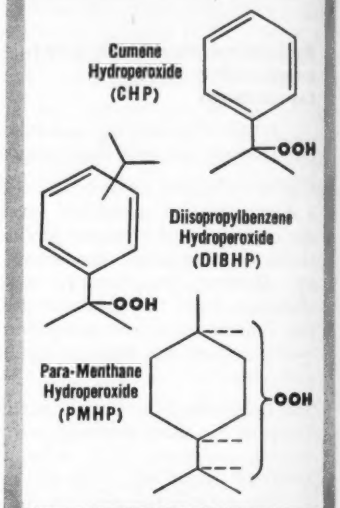
Teflon (tetrafluoroethylene resin) has made a very outstanding name for itself due to its unusual inertness to chemical media. Ways and means are constantly being sought to put Teflon to work in new applications, and along with this goes a need for knowledge of its fabrication.

Utility of Teflon TD-3 dispersion (a milky white liquid containing 60% resin suspended in water) lies in its fluid form, since the resin cannot be reduced to a fluid state by melting or by solution. Filling TD-3 with other resins and fillers is resulting in an unlimited number of interesting products. . . interesting from the standpoint of improved mechanical properties and also reduced cost.

Dispersion provides a medium for good distribution of the filler by simple mixing, followed by coagulat-

SOMETHING NEW!

3 Organic Hydroperoxides



Economically priced
Faster polymerization
High stability
Low temperature activity
Inhibition-resistant
Easily handled liquids

Widely used in the rubber industry, these Hercules hydroperoxides offer challenging opportunities elsewhere as polymerization catalysts with many properties superior to those of conventional peroxides. These hydroperoxides are also used for curing polyester resins. Write for complete details.

Naval Stores Department
HERCULES POWDER COMPANY
940 Market St., Wilmington 99, Del.

HERCULES

NH53-1

When inquiring check CP 1706 on handy form, pgs. 2-3

ing and drying. Compositions containing 50-80% by weight of inexpensive fillers have been prepared. Evaluation of filled compounds is still in preliminary stages, but it is apparent that proper selection of filler will yield many tailored compositions for chemical and electrical applications.

In general, the chemical resistance of filled compounds compares favorably with the resistance of the filler itself. Following tabulation should prove interesting:

PROPERTIES OF FILLED TEFLON COMPOSITIONS

Property	Unfilled	67% Carbon	50% Graphite	52% Asbestos	80% Copper
Tensile*, psi	1800	1790	2425	1780	2300
Elongation*, per cent	100-200	5.9	—	0.2	—
Modulus of elasticity*, psi	58,000	574,000	378,000	1,190,000	—
Flexural strength**, psi	didn't break	3980	4560	4080	4170
Compressive strength***, psi	didn't break	8650	5400	—	2900
Impact strength (Izod)†, ft-lb/in	4.0	0.8	0.86	0.86	—
Deformation (2000 psi, °F, 24 hr)††, %	25	0.9	—	0.3	—
Hardness †††, Shore "D"	55	75	68	75	82
Density of molding, gm/cc	2.14	1.95	2.10	2.4	5.0
Water absorption (2-hr boil), %	0	0.07	0	0.05	—

*ASTM test method D638.
**ASTM test method D790.
***ASTM test method D695.
†ASTM test method D256.
††ASTM test method D621.
†††ASTM test method D676.

(Teflon is a product of the Polychemicals Department, E. I. du Pont de Nemours & Company (Inc.), Dept. CP, Wilmington 98, Del. . . . or for more information check CP 1708, pages 2 and 3.)

Lists 275 isotopes — stable & unstable

A new catalog of isotopes, both radioactive and stable, has been announced by Oak Ridge National Laboratory, and replaces a previous edition published by the AEC in March of 1951.

More than 100 reactive radioactive and 175 stable isotopes are listed, together with prices and descriptive material. Isotopes catalog is issued upon $1.00 remittance direct to Carbide and Carbon Chemicals Company, Dept. CP, Oak Ridge National Laboratory, Post Office Box P, Oak Ridge, Tennessee.

YOUR BIG NEWS IN PIGMENTS--WILLIAMS NEW KROMA RED!

Gives a far brighter mass color, much cleaner tint, is more easily dispersed than any red iron oxide pigment yet produced!

MEANS THAT YOU CAN NOW USE A LOW COST IRON OXIDE PIGMENT FOR WORK WHERE MORE BRILLIANT COLORS ARE REQUIRED FROM LIGHT RED TO DEEP MAROON

Chemical and Physical Properties

Fe_2O_3.....95.0% MIN.
Sp.G.....4.80
Oil ABS.....21-22
Hiding SQ. FT. per LB.....850-1,000

KROMA RED APPLICATIONS:

Toy and furniture enamels
House and barn paints
Floor enamels
Resin and latex emulsion paints
Automotive finishes
Camouflage (high infrared reflectance)
Rubber products
Plastics
Textile finishes
Floor coverings
Building materials
Cement products
Leather finishes
Paper
. . . and many other uses.

Write today for complete tech report on Kroma Reds. Address Department 28, C. K. Williams & Co., Easton, Pa.

WILLIAMS
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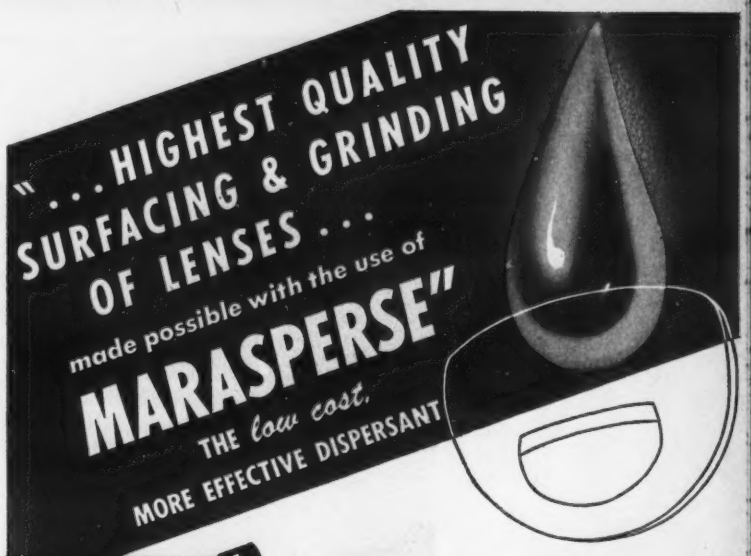
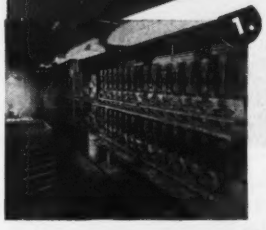
C. K. WILLIAMS & CO.
Easton, Pa. • East St. Louis, Ill.
Emeryville, Cal.

108 SHADES AND TYPES OF IRON OXIDE PIGMENTS

When inquiring check CP 1707 on handy form, pgs. 2-3

"...HIGHEST QUALITY SURFACING & GRINDING OF LENSES..." made possible with the use of MARASPERSE" THE low cost, MORE EFFECTIVE DISPERSANT

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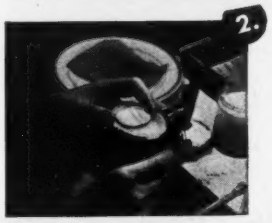
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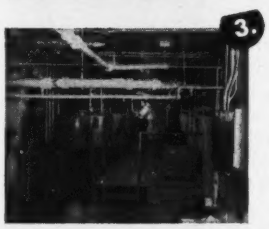
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In the 26 year history of Univis Lens Company of Dayton, Ohio, highest quality standards have been rigidly maintained. Only precision perfect lenses pass the critical inspections to which each lens is frequently subjected during manufacture.

The use of Marasperse N dispersant in the preparation of abrasives could not improve the quality of Univis Lenses, but it did increase production of perfect lenses by substantially reducing the number of rejects.

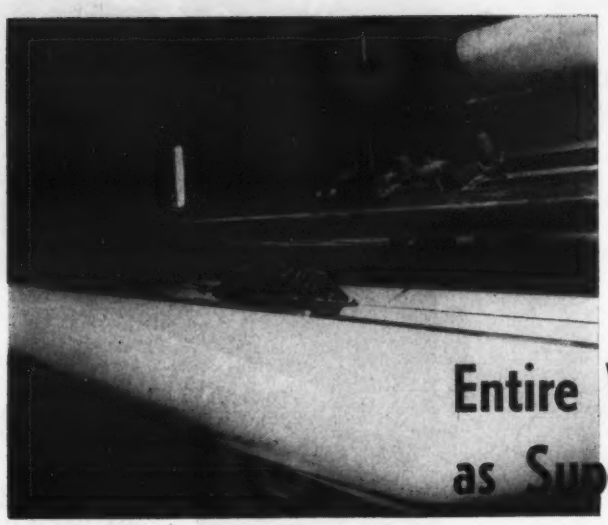
(Marasperse dispersants are used in a wide variety of industries . . . Textile, Petroleum, Ceramic, Glass, Leather, Insecticide, Industrial Cleaning, Rubber, Water Treatment and many others.)

1. Univis multifocal lenses receive the finest polish known to the optical industry on these specially built machines.
2. A skilled assembly operator fits together the component parts of a Univis multifocal lens. These lenses display a contact accuracy of five millionths of an inch as shown here by Newton's Rings!
3. With the addition of only 0.1 to 0.2% Marasperse N to their abrasive manufacturing system, Univis has succeeded in developing lens abrasives of the desired particle size and suspension characteristics, thereby giving the highest quality of grinding and surfacing that this company has ever experienced.
4. The tiniest scratch on any one of the multifocal segments of varying curvatures being ground on this machine is sufficient to cause its rejection from high quality lens production.

Write for File No. 601 for more detailed information about Marasperses. Learn how you can use them to advantage in your dispersion processes. Our technical staff will willingly cooperate with you.

MARATHON Corporation
CHEMICAL DIVISION • ROTHSCHILD, WISCONSIN

When inquiring check CP 1709 on handy form, pgs. 2-3



Closeup of gloss pickup head supported just above moving paper web 130" wide

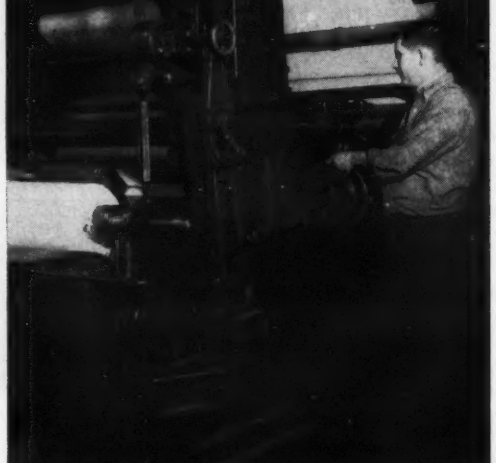
Entire Web Width Checked for Gloss as Supercalender Polishes Paper

"Gloss" of this sheet may not be noticeable to you, but if not uniform, it can cause lots of trouble for printers . . . traversing glossmeter checks whole polishing operation, *while corrections can still be made*

PROBLEM: Most people are only vaguely aware of the "gloss" difference in most types of paper. Differences between newsprint and shiny, slick magazine covers are obvious, but differences in gloss between various parts of the same lot of paper are not — though they can cause expensive delays and spoil work for the printer who uses such a lot.

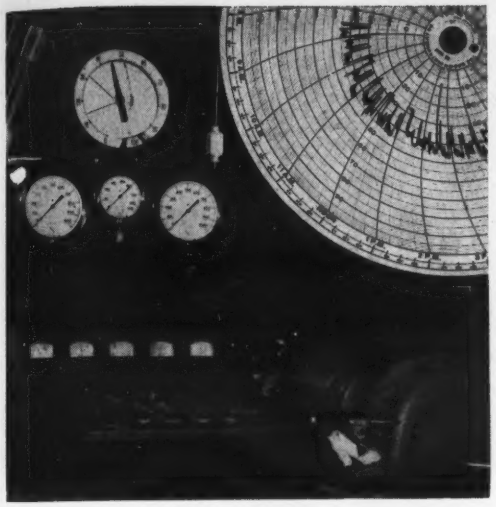
S. D. Warren Co. of Cumberland Mills, Maine, a major supplier of machine coated stock (this magazine page is typical of this type of paper), was anxious to produce paper which uniformly met its grade specifications.

Recording glossmeter could be used with supercalender, calender, waxing or other coating operations on paper — on coating operations for materials like plastics, linoleum, etc.



Pickup head is moved to any position over web for checking corrective actions

Gloss head (arrow) can be positioned anywhere over paper 130 inches wide on 145-inch supercalender



Gloss reading is indicated and recorded by round chart above control board. Inset shows typical gloss record — sharp dips are readings on bare roller while rolls were being changed

Routine inspection of paper was an established practice, but even though reject paper was reworked or sold as "seconds", a small amount of it inevitably appeared in better quality paper.

Solution: Four years ago this plant installed gloss recorders on supercalender stacks. These were attached to calender in one position and "saw" narrow strip of the web. While this was helpful, since it allowed a gloss measurement throughout the entire *length* of roll, conditions just a few feet from glossmeter sometimes caused poorer quality there.

Glossmeter operates by "bouncing" light beam from the paper surface at 75° from the vertical. Photoelectric pickup produces signal for recorder. Because of this "bouncing" arrangement, spacing between paper and pickup head was critical. It seemed to mean that a traversing glossmeter head would be doomed to failure.

Despite this, company installed traversing head on a 145-inch supercalender last January.

Head rides on angle iron support, is moved from side to side by means of pulley system, cable, and operator's crank. With this setup, entire *width*, as well as *length* of roll can be checked, faulty zones may be continuously checked while corrective action is taken, periodic scans of width may be made while supercalendering operation is in progress.

Results: Despite critical head-to-paper spacing, check of gloss readings at the calender against standard laboratory gloss readings showed that measurements can be made to fall within 4% consistently (this is ample accuracy). It has meant that very little paper needs to be sold for seconds or rerun, but principle importance to S. D. Warren Company is that they can count on customer satisfaction.

Since papermaking is still somewhat of an art, experienced operators were wary of glossmeter when

(Continued on next page)

Accurate, sensitive Foxboro Controls have played a vital part in the success of Boston Woven Hose & Rubber Company's "Rotocure"*, which permits continuous uniform vulcanizing of belting . . . eliminates waste and over-cured sections.

The latest "Rotocure" is designed to take full advantage of more rapidly curing compounds. It incorporates a Foxboro controlled progressive heat cycle to vary curing temperatures during the cycle . . . insures the proper temperature in each zone of the heat jacket. The result is faster, uniformly high quality vulcanizing without waste.

From the first "Rotocure" press installed in 1933, to this most advanced model, each press has been equipped with Foxboro Controls — clear evidence of the satisfactory performance of these controllers throughout years of service.

When you have an instrumentation problem, call in your local Foxboro representative — or write for application engineering data to cover your particular need.

Instruments (1) and (2) are Foxboro Dynalog Input Controllers on Chromalox radiant heaters. (3) is a Multi-Record Dynalog Temperature Recorder which provides continuous records of the critical curing zones. (4) is a Foxboro Dual Controller which maintains constant temperature within the steam-heated rolls.

***Reg. U. S. Pat. Off.**

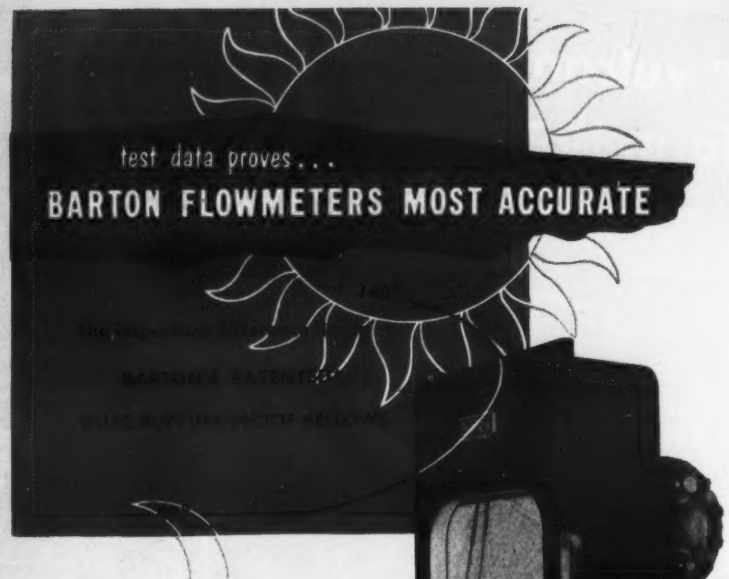
THE FOXBORO COMPANY, 816 NEPONSET AVE., FOXBORO, MASS., U. S. A.

FOXBORO
REG. U. S. PAT. OFF.

Instruments that improve product uniformity

FACTORIES IN THE UNITED STATES, CANADA AND ENGLAND

When inquiring check CP 1710 on handy form, pgs. 2-3



Scientifically controlled tests, impartially conducted, to determine the comparative accuracy of several flowmeters of popular designs have conclusively proved the superior advantages of Barton's Dual-Bellows meter body. The Barton was the only flowmeter that averaged less than 1% deviation from perfect calibration over a 100°F change in meter temperature; others tested deviated as much as 3%. The ingeniously engineered Barton Meter Body insures a higher order of accuracy when the instrument is subjected to normal day and night air temperature variations.

Sustained accuracy is one outstanding Barton flowmeter advantage. In addition, the actuating element is compact, rupture-proof, yet highly sensitive, insuring a long life with high responsiveness. Problems associated with mercury, pressure bearings and over-ranging are eliminated.

Externally adjustable pulsation dampner eliminates pen flutter and chart painting. Torque tube drive assures absence of leakage and friction. Barton flowmeters are completely self-draining, or venting...need no sealpots. *Install cost-cutting Barton flowmeters.*

PRECISION-ENGINEERED FOR

...faster response

...sustained accuracy

...lowest maintenance

COST-REDUCING FEATURES..

- No Mercury
- No Seal Pots
- No Leveling
- No Cleaning
- No Over-range Damage

...request Barton Bulletin 11C-4.

*Pat. Nos. 2400048, 2500360, 2590324, other patents pending.

BARTON INSTRUMENT CORPORATION
INDUSTRIAL INSTRUMENTS

1437 SOUTH EASTERN AVENUE, LOS ANGELES 22, CALIFORNIA

When inquiring check CP 1711 on handy form, pgs. 2-3

(*Continued from preceding page*)

first installed. Test results, however, convinced them of its value. They are now the first to sound off if recorder stops functioning, since they can make fast corrective adjustments with it. In fact, attitude of everyone concerned with calendering operations is that they would not run the stack without it.

S. D. Warren Company is now equipping three other calenders with traversing gloss heads and recorders. This is an addition to stationary gloss meters used on smaller calendering machines.

(Dust Compensated 75° Gloss Recorder is a product of Henry A. Gardner Laboratory, Inc., Dept. CP, 4723 Elm St., Bethesda 14, Md. . . . or for more information check CP 1712, pgs. 2 & 3.)

Designed for acid flow, steel valves are non-leaking

Uses: Where check valve is used with acids, corrosives.

Features: Check valve is reported to provide excellent performance and "dead-tight" sealing from temps below –65° to 550°F.

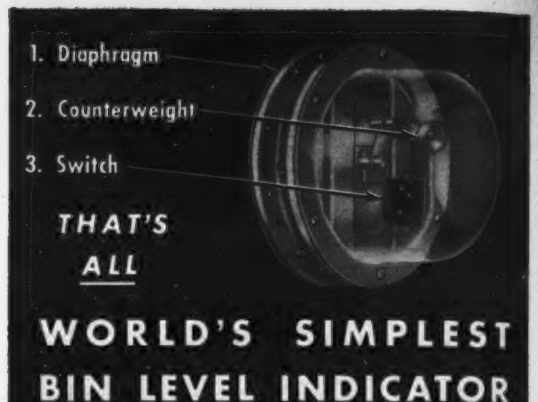
Description: Non-leaking, stainless steel check valve incorporates the firm's "Circle-Seal" principle, but employs Teflon O-rings and gaskets for this special usage due

Sectional view of check valve

to the chemically-inert properties of this material. A characteristic of Teflon is that it flows under pressure which becomes an advantage when employed with the "Circle-Seal" principle in that it increases sealing efficiency.

These stainless steel valves are supplied in various grades depending on the required service, with male tube or female pipe connections.

(Product of James-Pond-Clark, Dept. CP, 2181 E. Foothill Blvd., Pasadena 8, Calif. . . . or for more information check CP 1713 on handy form, pages 2 and 3.)



WORLD'S SIMPLEST BIN LEVEL INDICATOR

BIN-DICATOR

NO MOTORS • NO SPRINGS • NO OILING

This is the first simple, dependable, low-cost automatic bin level indicator. Units installed 20 years ago are still in daily use. Watches *and reports* material levels in bins, silos, hoppers, chutes, etc.; automatically starts, stops filling machinery. Free catalog. Write—

THE BIN-DICATOR CO.

13946-D KERCHEVAL • DETROIT 15, MICHIGAN

When inquiring check CP 1714 on handy form, pgs. 2-3

Work with adhesives? catsup? oils?

TEST • STUDY • CONTROL
VISCOSITY
As Simply, Quickly and Easily as Taking Temperature Readings

WITH A Brookfield
SYNCHRO-LECTRIC
VISCOMETER

Adaptable to any problem from less than one to 32,000,000 centipoises. Send for illustrated catalog.

Just a flick of a switch, then read the Brookfield dial, and you have your viscosity determination in centipoises. The whole operation, including cleaning up, *takes only a minute or two.*

Available in a variety of models suitable for extremely accurate work with both Newtonian and non-Newtonian materials, Brookfield Viscometers are portable and plug in any A.C. outlet. *Write today.*

Well-known national manufacturer of vegetable, animal and resin adhesives reports: "Have standardized on Brookfield Viscometers for research and quality control in all our plants and laboratories."

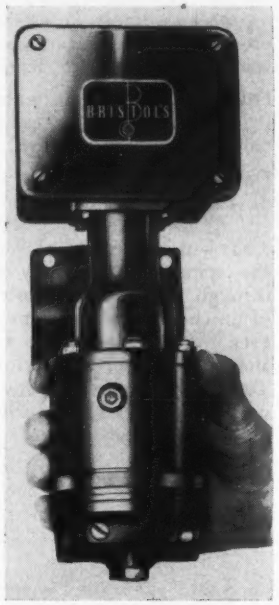
Write Dept. A., Stoughton, Mass.

BROOKFIELD ENGINEERING LABORATORIES, INC.

When inquiring check CP 1715 on handy form, pgs. 2-3

Transmits usual variables with 0.03% sensitivity as 3-15 psi signal . . .

7½-pound transmitter works in any position, can put out 3.0 scfm



Weather proof transmitter operates in any position

Miniature pneumatic element transmits signals proportional to temperature, pressure, vacuum, differential pressure, liquid level, and similar variables. It may be used with recording, indicating or controlling devices. Signals are transmitted by conventional pneumatic pressures of 3-15 pounds per square inch. Signals are directly related to the measured quantity.

Manufacturer has used standard measuring elements combined with a simple transmitting mechanism. Transmitter employs only one pivot, has no flexures. Thus, friction and lost motion are greatly reduced. Because of this, transmitter is sensitive to extremely small changes in measured value — as little as 0.03% of range. This figure includes reversal. High-speed transmission and good control qualities are achieved with a pneumatic relay having an output capacity of 3 standard cubic feet per minute.

Transmitter weighs 7½ pounds and is designed for use with miniature as well as conventional receivers. It is weatherproof, can be installed in any location, and will operate in any position.

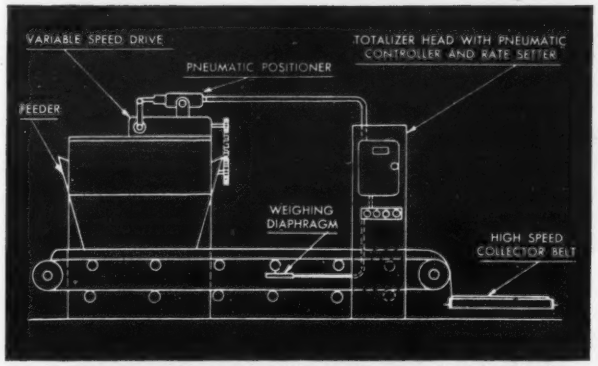
(Series 650 Pneumatic Transmitter has been developed by The Bristol Company, Dept. CP, Waterbury 20, Conn. . . . or for more information check CP 1716 on convenient Reader Service slip between pages two and three.)

Explains uses of simple dial-type dynamometer

Six-page publication presents several photographs showing dial-type dynamometer being used in a variety of work. Typical uses included straight testing, torque measurement, checking of drawbar pull, etc. Operation and features of instrument with five or ten-inch diameter scale are explained.

Bul D4 is issued by W. C. Dillon & Co., Inc., Dept. CP, 14620 Keswick St., Van Nuys, Calif. When inquiring specify CP 1717 on handy form, pages 2 and 3.

WEIGH IT ... on the Go!



Typical Conveyoflo installation showing Model CFAB-T Conveyoflo Meter controlling flow of tobacco in automatic blending process. Conveyoflo employs pneumatic controller to automatically control feeder output within very narrow tolerances.

Conveyoflo Meters are serving in many other process industries: food, soap, fertilizer, pharmaceutical, steel, paper, glass, heavy chemicals, mining, power. What's *your processing problem?*

Weigh it with BUILDERS CONVEYOFLO . . . the modern meter for *continuous, accurate weighing* of bulk material passing over conveyor belts. This precision meter can be equipped with a Controller to maintain any desired preset rate of delivery from the conveyor in which it is installed. Or it can be used to pace auxiliary feeders in automatic processing systems. Conveyoflo is furnished as a separate, self-contained unit— or for installation in your present conveyor lines.

CONVEYOFLO FEATURES

- **ACCURATE . . . within ±½ of 1% of actual weight from maximum to 50% of rated capacity; within 1% from 50% to 25% rate; within 2% from 25% to 10% of meter's rated capacity.**
- **COMPACT . . . weight sensing mechanism completely contained within conveyor structure. No overhead levers. Panel stand only 9" x 18" — may be any height.**
- **AUTOMATIC TOTALIZER COMPENSATION for variations in belt speed and changes in belt weight.**
- **RESPONDS ACCURATELY to rapid load variations.**
- **PACES AUXILIARY EQUIPMENT (feeders, controllers, continuous blending processes, etc.) and operates secondary totalizers, indicators, recorders.**

BUILDERS

B-I-F INDUSTRIES (DIVISION OF B-I-F INDUSTRIES) BUILDERS

SEND COUPON FOR DETAILS

BUILDERS-PROVIDENCE, INC.
387 Harris Ave., Providence 1, R. I.
Please send Bulletin 550-H4 describing Builders Conveyoflo Meter.

Name.....

Company.....

Street.....

City.....State.....

When inquiring check CP 1718 on handy form, pgs. 2-3

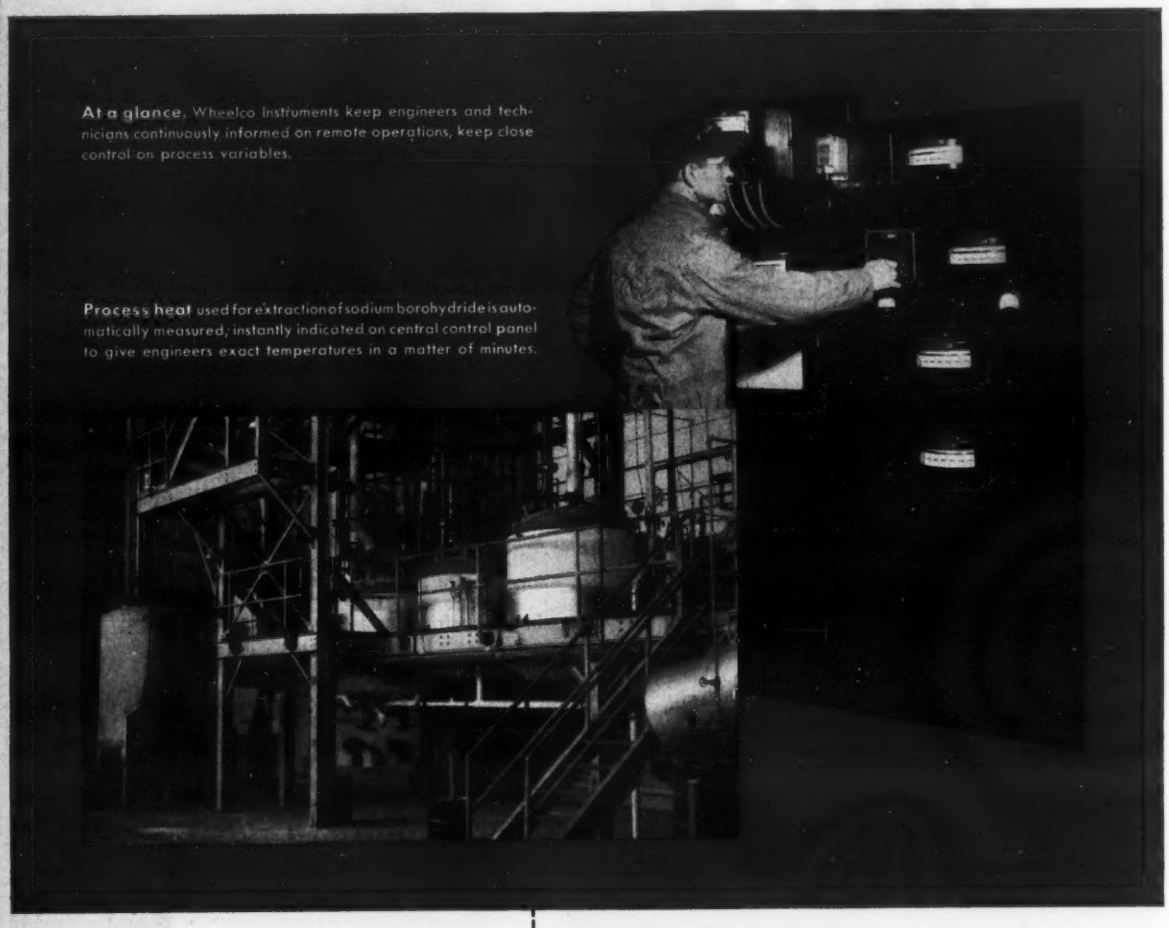
BARBER COLMAN

Wheelco Instruments

. . . control process variables precisely in METAL HYDRIDES' new million-dollar plant

Metal Hydrides, Inc. produces commercial hydrides by a new method of chemical processing in which hydrogen is introduced into base metal under controlled heat and pressure. Full-scale production is now under way in a new million-dollar plant in Beverly, Mass.—equipped with Wheelco Instruments to help bridge the gap between remote processing equipment and close control required over critical variables.

Easy-to-read, remote measurements, and a continuous permanent process record is assured with Wheelco's Capacilog. Instant, *electronic* response assures precise, accurate recordings from the same or different processing operations. All standard control combinations including pneumatic and electric proportioning types available.



At a glance, Wheelco Instruments keep engineers and technicians continuously informed on remote operations, keep close control on process variables.

Process heat used for extraction of sodium borohydride is automatically measured, instantly indicated on central control panel to give engineers exact temperatures in a matter of minutes.

Write for bulletin MPC-1

Factory-trained field engineers in all principal cities

BARBER-COLMAN COMPANY, ROCKFORD, ILLINOIS

Industrial Instruments • Automatic Controls • Air Distribution Products Aircraft Controls • Small Motors • OVERdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

WHEELCO INSTRUMENTS DIVISION
BARBER-COLMAN COMPANY, DEPT. F, 1520 ROCK ST., ROCKFORD, ILLINOIS

Gentlemen: I'm interested in learning more about Wheelco Multipoint Capacilogs for the chemical industry. ☐ Please send free bulletin MPC-1. ☐ Have field engineer call.

Name_____

Firm Name_____

Address_____

City_____ State_____

When inquiring check CP 1719 on handy form, pgs. 2-3

Speed control without tubes gives 150 to 1 range up to 200 hp . . .

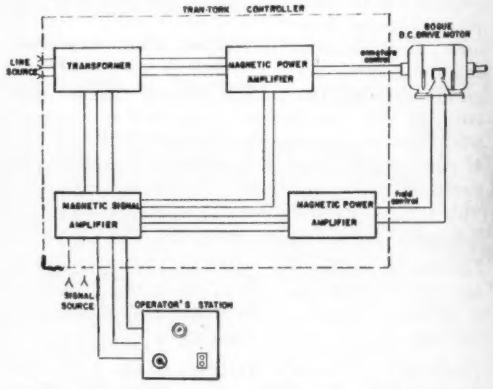
even where constant torque must be maintained, speed range of 30 to 1 is achieved

Uses: For speed control of equipment processing plastics, linoleum, asbestos, paper, and similar products. Systems can provide manual or automatic control of speed, tension, torque, or load.

Features: Magnetic amplifiers are used rather than vacuum tubes or gas filled tubes. Since no moving parts are employed, maintenance is slight.

Description: Industrial drive system is capable of automatic regulation and control. It can be set up for governing speed, tension, torque, or load, within specified tolerances. Field tests with the system have usually shown good economy through lower maintenance cost and elimination of unscheduled shut-downs. Earlier systems, however, were designed for a particular application and built for specific performance ratings. Tran-Tork systems now embody identical principle of operation, but are designed as package units suitable for any job within their rating.

Systems are available for horsepower requirements between fractional and 200 hp. Drive consists of three basic sections: drive motor, operator station, and controller panel. Controller panel houses a



Schematic diagram shows arrangement and wiring of components in magnetic amplifier speed control system for fractional to 200 hp requirements

magnetic amplifier. This is built around component called a transductor, closely related to a transformer, but using a high-permeability iron core. Amplifications up to one million can be accomplished in response times comparable to those of gas-tube systems. Rectified power is supplied by selenium rectifiers.

Throughout motor power ranges of fractional to 200 hp, speed ranges of 150 to 1 can be attained where constant torque is not a consideration.

For more information on product advertised at right, specify CP 1720 . . . see information request blank between pages 2 - 3.

LADISH *Controlled Quality* ASSURES METALLURGICAL SOUNDNESS

SPECTROGRAPHIC ANALYSIS
One of many comprehensive Ladish laboratory test procedures for assuring reliable performance.

TO MARK PROGRESS

Ladish measures the spectrum to verify chemical composition

Metallurgical integrity—is safeguarded at Ladish by unsurpassed laboratory controls. Typical is this advanced electronic direct-reading spectrograph. On this unit as many as 300 determinations have been made in one hour to verify compliance of each mill heat with exacting Ladish specifications and, equally important, to assure the absence of detrimental "tramp" elements. Here is but one indication of the thorough, scientific procedures that assure reliability in every Ladish Controlled Quality fitting.

THE COMPLETE *Controlled Quality* FITTINGS LINE
PRODUCED UNDER ONE ROOF . . . ONE RESPONSIBILITY

LADISH CO.

CUDAHY, WISCONSIN
MILWAUKEE SUBURB

District Offices: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland • Chicago • St. Paul
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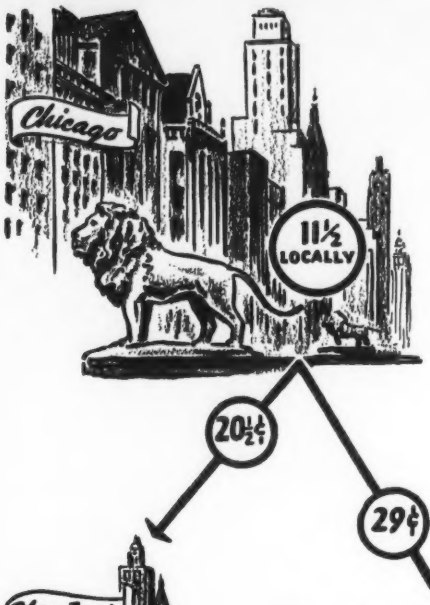

Can you guess How Much it cost to mail you this copy of CHEMICAL PROCESSING?

29c . . . if you live in San Francisco. 20½c if your home is in New York; 26c to Portland; 23c to Miami; 11½c if you live here in Chicago. That means $1.38 to $3.48 per year . . . for postage alone. Yet this magazine comes to you without charge.

Why do we do it?

Why don't we demand that you buy a subscription? Well, strange as it may seem, it usually costs more to sell a subscription than the publisher gets out of it . . . and a good many important men simply can't be reached when selling subscriptions.

Then where DO publishers' dollars come from?

Contrary to what many folks think, subscription revenue is hardly a "drop in the bucket" of a publisher's income. Most all of it must come from the advertising sold.

So the publisher must get maximum readership from the maximum number of readers in the field . . . from men like yourself . . . so his advertising pages will be of greatest value.

Advertisers demand best coverage.

Since the advertisers pay the bills, the publisher can succeed only as he publishes the most readable magazine and then gets the best possible coverage of the best readers in the field.

And, as you can see, the most effective method of getting such coverage is (a) to hand-pick the most important men, (b) send the magazine to ALL of these men, and (c) make it so valuable, so interesting that they will want to read it.

That's why you get CHEMICAL PROCESSING . . . without charge. You are important in chemical processing, hence you are important to our advertisers, hence you are important to us as publishers. That's why we spend many thousands of dollars on every issue of CHEMICAL PROCESSING, to make it of top interest to you in your work — to make every issue more than worth your reading time. That's why CHEMICAL PROCESSING comes to you without charge.

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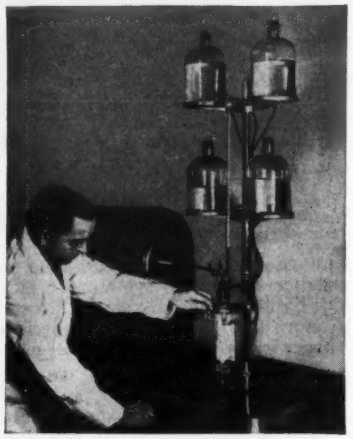
PRACTICAL SULFUR ANALYSIS

Accurate Results in 3 MINUTES with the

DIETERT-DETROIT SULFUR DETERMINATOR



No. 3104 Three Minute Sulfur Determinator

The Dietert-Detroit Sulfur Determinator used with the Varitemp or Hitemp Combustion Furnace provides the most practical means of getting results in a few minutes with accuracy equal to or better than any other method.

APPLICATIONS	FEATURES
Metals and Ores	Lowest First Cost
Fuel Oil and Lubricants	Simple Operation
Solid Fuels and Greases	Exact End Point
Rubber and Plastics	Visible Reagents
Inorganic Sulfates	Efficient Bubbler
Organic Chemicals	Meets A.S.T.M. Spec.

Let our chemists suggest a complete ready-to-go set-up to solve your sulfur analysis problems.

CONTROL EQUIPMENT
HARRY W. DIETERT COMPANY
9330 ROSELAWN • DETROIT 4, MICH.

When inquiring check CP 1721 on handy form, pgs. 2-3

Where torque must remain constant, speed ranges from 30 to 1 or better can be attained.

Controller is very compact — a 10 hp controller occupies a space of approximately 2 x 1½ x 3 feet.

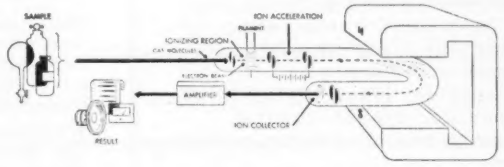
(TranTork Industrial Drive is a development of Bogue Electric Mfg. Co., Dept. CP, 52 Iowa Ave., Paterson 3, N. J. . . . check CP 1722, pgs. 2 & 3.)

Programmer steers scanning of mass spectrometer . . .

will analyze for fragments from 12 to 40 mol wt, or as high as 80

Mass spectrometer is specifically designed to monitor and control continuous processes in chemical plants and oil refineries. It is capable of almost immediate measurement of any process-gas constituent within its range. Simpler than earlier models, it is designed to fit into complex manufacturing and processing operations. Available accessories adapted for use as highly sensitive leak detector or an instrument for routine analysis.

Any individual molecular fragment from mass 12 through 40 can be monitored with satisfactory separation between adjacent masses. Where separation is not important, range can be extended to



Schematic diagram above shows the principal parts of mass spectrometer

mass 80. Auxiliary programmer permits periodic scanning of a preselected group of masses. Scanning over instrument's entire range can be readily performed by operator. Hydrogen or helium can be monitored by adding accessory movable shunt to analyzer magnet.

Manually operated attenuation control permits reducing sensitivity by discreet factors up to 1000. This provides accurate output indications over wide dynamic range. Fragment abundances are indicated by output meter. Provision is also made for either chart recorder or other indicating devices. Output signal may be used to actuate servo-operated equipment for control of process being monitored.

Unit is mounted on casters, is roughly the size of a small table. Pull-out electronic chassis permit easy checking and maintenance without interrupting service. Chassis units are replaceable. Instrument operates from 115 v AC line, has self-contained regulated power supply. Full scale output signal is 10 millivolts.

(Model 21-610 Mass Spectrometer is a development of Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. . . . check CP 1723, pages 2 & 3.)

Although WESTON provides sensing elements of various forms for special applications, the element in all standard WESTON Industrial Thermometers is a *multiple helix* as illustrated above. Why the more costly *multiple*, instead of the single, helix? *Just one reason.* WESTON's twenty years experience producing bi-metal thermometers for industry has furnished convincing proof that the shorter, non-sagging *multiple* helix provides better accuracy, over longer periods. And while it provides other advantages, the one thing most thermometer buyers demand is long-term dependability. You get it, in extra measure, in WESTON Thermometers with *multiple* helix. WESTON Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N. J.

WESTON *Thermometers*

When inquiring check CP 1724 on handy form, pgs. 2-3

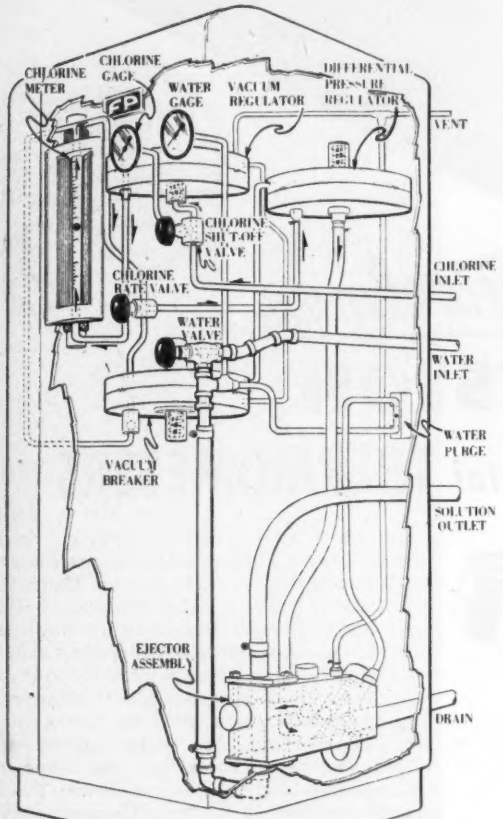
Controls chlorine addition for rates up to 1000 pounds a day . . .

Uscolite, Teflon, Kel-F, Hastelloy "C", Monel, silver, tantalum used for corrosion resistance

Uses: Solution feed chlorine dispenser is suitable for manual or automatic proportioning and control in capacity ranges up to 1000 pounds per day maximum.

Features: Wide variety of corrosion-resistant materials has been used to insure trouble free operations. Materials used include Uscolite, Teflon, Kel-F, Hastelloy "C", Monel, silver and tantalum.

Description: Vacuum-type solution feed chlorine dispenser is unaffected by either dry or wet chlorine gas. Large diaphragm area in regulators, and minimum friction in the few moving parts assure constant chlorine flow rate in manual reset



Outline drawing shows principal parts of vacuum-type, chlorine dispenser

model and accurate ratios in automatic proportioning dispenser. Chlorine flow rate is changed by simple valve setting while vacuum is held constant. Thus dispenser may be readily adapted for remote setting with air-operated diaphragm motor valve. Although in normal operation chlorine remains completely dry until regulated flow of gas enters

NOW... A NEW, COMPLETE ELECTRONIC PROCESS CONTROL SYSTEM

How to *improve quality of control and reduce capital investment* to obtain a given through-put are problems of vital importance in the process industries.

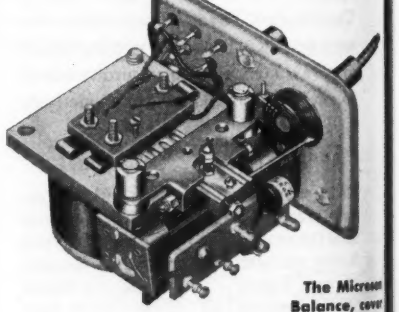
The American Electronic Process Control System — a new and complete electronic system — answers both problems in every respect. It utilizes all the advantages and superiorities of electric transmission of measurement and operational signals. It is the most efficient means ever developed for measuring and controlling temperature, pressure, differential pressure, liquid level and flow. Every requirement for accuracy, dependability, flexibility, low maintenance and convenient servicing is fully satisfied, because the American Electronic Process Control System provides:

1. Virtually no lag in signal transmission.
2. A degree of stability so high that narrower proportional bands can be used.
3. A degree of sensitivity practically impossible to duplicate in any other type of actuation.
4. Complete freedom from dirt, corrosion, leakage and freeze-ups.
5. Standardization of control components that permits interchange at the control panel, regardless of the type of variable under control.
6. Installation of all controllers right in the control house, any distance from the process area, because of the dependability and accuracy of electrical signal transmission.
7. Plug-in components in each instrument to simplify servicing.
8. Adaptability that permits more than one input circuit to be fed into a controller for cascading purposes, without using an additional relay.
9. Flexibility that makes it practical to feed the output signal in series to any number of receivers, without impairing accuracy.
10. Practically no investment in air compressors, filters, pressure regulators, or dryers and their maintenance.
11. Transducers for installation where a tie-in with pneumatic systems is required.
12. Suitability for service with analog and digital computational and print-out equipment for statistical and record purposes.
13. Multipoint-potentiometer type recording of all variables for permanent records.

Major instruments that make up the complete American Electronic Process Control System are pictured here. All are made by Manning, Maxwell & Moore, Inc., a company with more than a century of experience in manufacturing precision instruments for all industry.

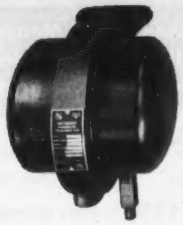
Whatever your process control problem, we welcome the opportunity to demonstrate how the American Electronic Process Control System can improve the *quality* of your control and reduce the size and cost of process equipment for a given through-put. Your inquiry is invited. **Write for Catalog No. 164.**

THE MICROSEN BALANCE — a compact, modified Kelvin Galvanometer structure which operates on the force balance principle — is the "nerve center" of American Electronic Instruments. It has a rectified oscillator output of .5 to 5 milliamperes which serves as the transmission signal. The transmission of pressure, differential pressure, temperature, liquid level or flow information is practically instantaneous.

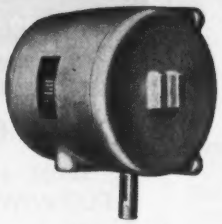


The Microsen Balance, cover removed.

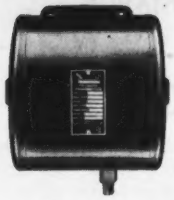
AMERICAN



General Purpose Case

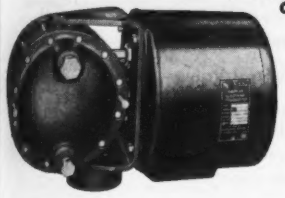


Explosion Proof Case

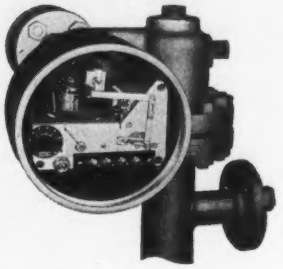


Vapor Proof Case

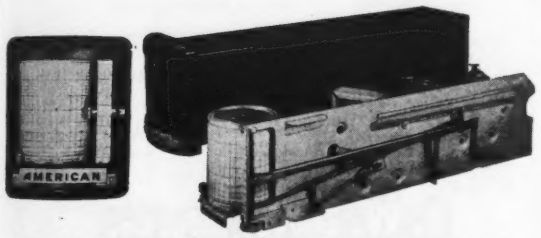
American Electronic Differential Pressure Transmitter with Barton Cell



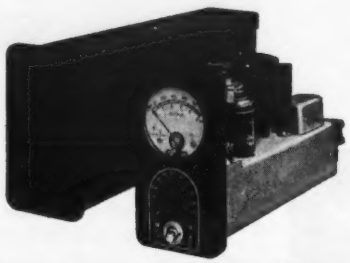
American Electronic Transmitter with Displacement Type Liquid Level Instrument



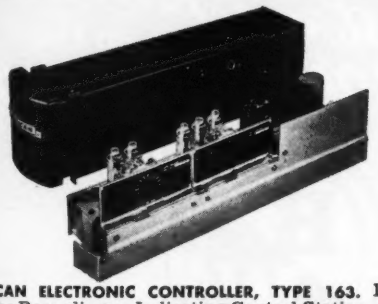
AMERICAN ELECTRONIC TRANSMITTERS are made in types to transmit temperature, pressure, differential pressure, liquid level or flow measurements. *Pressures* are measured by Bourdon tube or bellows elements; *differential pressures* by a Barton differential pressure cell; *temperatures* by standard thermocouples or thermostatic elements; *flow* by a Barton differential pressure cell; *liquid level* by a displacement type unit or a Barton cell. General purpose, vapor-proof and explosion-proof cases are available as required. **Write for Catalog No. 400A.**



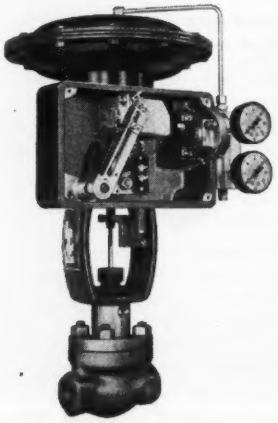
AMERICAN ELECTRONIC RECORDING CONTROL STATION, TYPE 162. A combination of two instruments: (1) a vertical scale card chart recorder which records the value of the process variable; (2) an adjustable set point which determines the control point of the Controller. Calibration of both instruments is indicated on a common scale. Motion of the recording pen is in a straight line; chart speed is ¼" per hour (one card in 24 hours). The American Electronic Indicating Control Station, Type 161, is available for applications where the recording feature is not desired.



AMERICAN ELECTRONIC MANUAL POSITIONER, TYPE 153MP. A regulated source of direct current suitable for remote loading of the electro-pneumatic valve positioner or the electro-pneumatic transducer. It is designed for use with the Type 163 Controller. Provision is made for switching between automatic and manual control without altering output current to the power device.



AMERICAN ELECTRONIC CONTROLLER, TYPE 163. Receives from the Recording or Indicating Control Station a voltage which is the output actuating signal. The output current thus automatically controls the manipulation of a process variable by means of the electro-pneumatic valve positioner or an electro-pneumatic transducer. In addition to proportional actions, *automatic reset* is provided to eliminate the effect that results from a process load change; also *rate action* to reduce the amplitude and duration of transient errors. When used with a manual positioning station, provision is made for "bumpless" transfer from automatic to manual.



AMERICAN ELECTRO-PNEUMATIC VALVE POSITIONER, TYPE 132C. Provides precision positioning of all standard pneumatically powered valves by an electric signal. May be used with either air-to-open or air-to-close valves. A split range model is available for sequential operation of 2 or 3 valves from a single transmission circuit. As an example of speed of response, in a valve having a final volume of 65 cubic inches, the time required to reach full stroke position is less than 3 seconds.

INDUSTRIAL INSTRUMENTS

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT

MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'HANCOCK' VALVES, 'ASHCROFT' GAUGES, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, AIRCRAFT PRODUCTS. BUILDERS OF "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES.

When inquiring check CP 1725 on handy form, pgs. 2-3

water stream at injector, dispenser is unaffected even if water vapor gets into chlorine lines.

Gas enters dispenser at its vapor pressure and flows through shut off valve to vacuum regulator. Here gas is reduced to partial vacuum (about 20 inches water column). Gas then passes through wide range flow meter to chlorine rate valve. Rate is determined by effective port area (valve setting) and also differential pressure across rate valve — a pressure regulator is used.

Flow meter and chlorine (and water) pressure gages are conveniently located on dispenser housing together with control knobs. These include shut off valve, water shut off valve, and chlorine rate valve. Maximum overall dimensions of housing itself are 20 x 15 x 57" high.

(Ratochlor is a development of Fischer & Porter Co., Dept. CP, Hatboro, Pa. . . . or for more information check CP 1726 on handy form, pages two and three.)

Rubber case absorbs jolts given pocket pyrometer's sensitive meter . . .

built-in glass thermometer gives temperature at cold end for correction

Uses: Various models and thermocouple pairs are available in ranges from 0-600°F to 0-2500°F.

Features: Sensitive millivolt meter is used to provide accuracy of ±2% and this instrument is protected by a shock absorbing rubber case.

Description: Pyrometer is a pocket-size instrument measuring 3⅞ x 3½ x 1¾ inches and weighs only a pound. Scale of indicating meter is 2.4 inches long and is available in five standard ranges. Thermocouples used with pyrometer are connected to the instrument by means of coaxial connector which provides positive contact. Connections are polarized to prevent misuse.

Three models are available to cover the following ranges: 0 to 600, 1000, 1500, 2000, and 2500°F. Two highest ranges are covered by chromel-alumel couples, others by iron-constantan couples. Cold end compensation is simplified by an accurate glass thermometer mounted directly on the case.

Typical sensing probe is supplied with stainless, flexible armored cable 24 inches long. Thermocouple end is available in the following types: a needle for use with plastic materials, rubber, wax, etc; surface type tip with fine iron-constantan wire treminated on a silver disc for checking flat surfaces; and ribbon surface type couple with iron-constantan ribbon having junction at its midpoint held taut by spring steel bow. Ribbon type couple is used for taking temperature of any revolving or stationary roll, etc. Thermocouples are also available in 6-inch ceramic tube housing.

(Pocket Pyrometers — Series 240-T — are products of Cybertronic Corporation of America, Dept. CP, 136 Eighth St., Upland, Chester, Pa. . . . or for more information check CP 1727 on handy form, pages 2 and 3.)

BENDIX FRIEZ

Just right for your job!

high-precision thermistors by BENDIX-FRIEZ

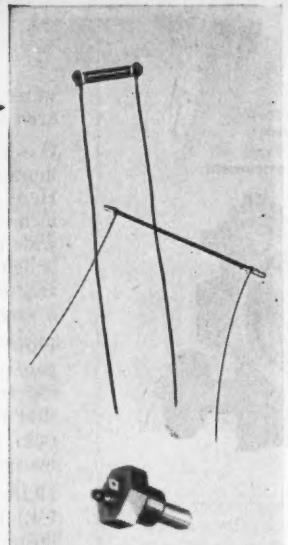
As temperature measuring elements and liquid level sensors, these temperature responsive resistors are the best you can buy. In standard or special types, their high-precision manufacture makes them precisely right for your job when it comes to resistance values, size, temperature coefficient, mountings and quality. Ask us about applications.

STANDARD TYPES FOR IMMEDIATE DELIVERY

Size (inches)	@ +30°C.	@ 0°C.	@ −30°C.
.140 x .75	45.0 ohms	86 ohms	194 ohms
.040 x 1.5	12,250 ohms	26,200 ohms	65,340 ohms
.018 x 1.5	35,000 ohms	82,290 ohms	229,600 ohms

Write for information about Bendix Friez Weatherman lobby installations.

FRIEZ INSTRUMENT DIVISION of . .
1450 Taylor Avenue, BALTIMORE 4, MARYLAND
Export Sales: Bendix International Division
72 Fifth Avenue, New York 11, N. Y.



Used in this typical application for sensing the temperature of hydraulic oil.

Bendix AVIATION CORPORATION

When inquiring check CP 1728 on handy form, pgs. 2-3

Prevent thermometer fogging

No matter how long you dunk it, you can't cloud the accuracy of a Rochester dial thermometer.

THIS SUBMERSIBLE QUALITY is important to you. It means fast, easy temperature readings . . . without any danger of a foggy crystal causing inaccuracy. Rochester dial thermometers are assembled and hermetically sealed in a special humidity-controlled "dry" room. This eliminates any possibility of condensation inside the thermometer.

ALL STAINLESS STEEL CONSTRUCTION— All outer parts (except crystal) of Rochester dial thermometers are stainless steel. What's more, the case, stem and nut are fused into a single *corrosion-resistant* unit by an exclusive Rochester welding process.

EXCLUSIVE OUTSIDE RECALIBRATION— Rochester makes the *only* industrial thermometer that can be recalibrated from outside the case. If an extremely hard blow should knock it out of adjustment, you can have it back on the job in less than a minute . . . without taking the thermometer apart or breaking the hermetic seal.

You can order Rochester thermometers from one of our specialized instrument representatives listed in Sweet's Catalog. Or write direct for full details.

MILLIONS of Rochester dial thermometers are now delivering dependable service.

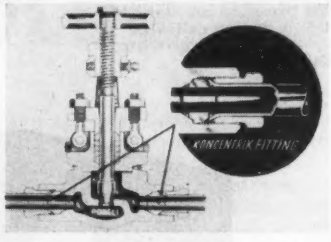
Rochester Manufacturing Company, Inc.
86 Rockwood St., Rochester 10, N. Y.
DIAL THERMOMETERS GAUGES AMMETERS

When inquiring check CP 1729 on handy form, pgs. 2-3

INSTRUMENTATION

Valve connections need no adaptors

Valves, in either stainless or Monel, are available with machined-in Koncentrik flared-tube connections for tubing through 1" OD. Integral construction is said to eliminate need for adaptors or back-welded assembly, and guard against line leaks with Teflon-reinforced double-sealing seat. Other advantages are greater compactness, easy assembly, and maximum flexibility, according to manufacturer. Valves available include needle, globe, gate, and check.



Insert shows integral construction

(Koncentrik connections for Powell valves are a product of The Special Screw Products Co., Dept. CP, 5445 Dunham Rd., Bedford, Ohio . . . check CP 1730, pgs. 2 & 3.)

Pocket-size folder gives useful engineering data

Six-page, pocket size folder entitled "Desk Calculator" presents in easy-to-use form formulas, constants, and conversion factors useful in basic engineering, blast cleaning, and dust control calculations.

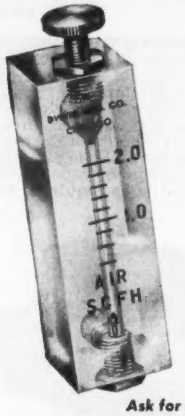
Included are geometric relationships for circles, squares, cylinders, spheres, pyramids, cones, and trapezoids; measures of pressure; and calculation guides for determining tank capacities in gallons.

Other major categories of basic information include formulas for dust control work, tables on shot and grit sizes, and metric measurements and conversion factors.

"Desk Calculator" is available from Pangborn Corp., Dept. CP, Hagerstown, Md. When inquiring specify CP 1731 on handy form, pages 2 and 3.

Precision Laboratory Measurement of
- Small quantities of gas or air flow
- Replacement for sight feed bubblers

DWYER SERIES 490 FLOWMETER



Accuracy—Readings are on-the-line—not approximations.

Easy to read—Light enters from all sides of the solid acrylic transparent body for easy reading. Tapered indicating tube precision drilled, reamed and polished.

Control Valve—Built-in.

Scales—Standard 0-2, 0-4 or 0-10 CFH. Air, 0-100 CC/Min. Water. Special ranges available in production quantities.

Models—Single or multiple units, surface mounting type.

Mounting Holes—To specification.

Fittings—⅛ SPT connections provided.

Dimensions—4" high x 1" square.

Ask for complete information.

F. W. Dwyer Mfg. Co.
335 S. Western Ave. Chicago 12, Illinois

When inquiring check CP 1732 on handy form, pgs. 2-3

First and Foremost in the FLOATLESS CONTROL FIELD

B W

Floatless

LIQUID LEVEL and INDUSTRIAL CONTROLS

—Write for Catalog—

B/W CONTROLLER CORPORATION
2204 East Maple Road, Birmingham, Michigan

FIRST IN THE FLOATLESS CONTROL FIELD

When inquiring check CP 1733 on handy form, pgs. 2-3

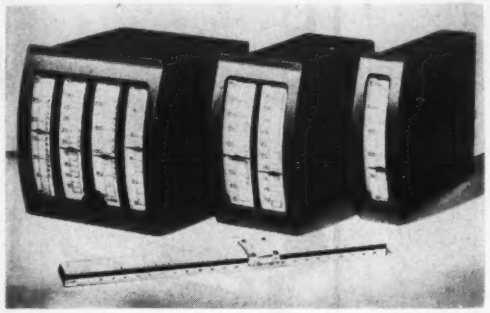
Four head, pressure, or temp scales mount in panel space smaller than dial gage . . .

four-unit instrument required panel opening of only 5⅜ x 5⅝ inches

Uses: Indicators have vertical scales suitable for direct reading of pressure or temperature.

Features: All units have legible 4-inch scale yet require opening of only 5⅜ x 1½ inch for single unit or 5⅜ x 5⅝ inches for a 4-unit multiple.

Description: Designed specifically for panel mounting, multiple purpose gages are suitable for graphic or process control panels. All parts in complete assemblies are interchangeable. Even in



Four thermometers or gages fit in panel space smaller than that required for a single conventional indicator

multiple units, each measuring unit is a complete and independent instrument — one or more such units can be replaced or rearranged without disturbing entire installation.

Vertical design permits indicators to be placed adjacent to one another. They operate on transmitted pneumatic pressures of 3 to 15 psig. Unit has calibrated metallic bellow measuring element.

Thermometer scale ranges run from a low of –200°F to as high as 1000°F. Thermometers can be equipped with spiral bourdon tubes and flexible stainless braid armored capillary connecting tubes for any length to 150 feet. Sensitive bulbs are of brass, steel, stainless or other metals as required.

Pressure gages are available from a low of 0-10 psig to as high as 0-1000 psig. Metallic bellows are used in all pressure gages below 60 psig, spiral bourdon tubes on higher pressure.

(Mindicators are products of The Dickson Co., Dept. CP, 7420 Woodlawn Ave., Chicago 19, Ill. . . . check CP 1734 on form, pages two and three.)

A company name and address . . .

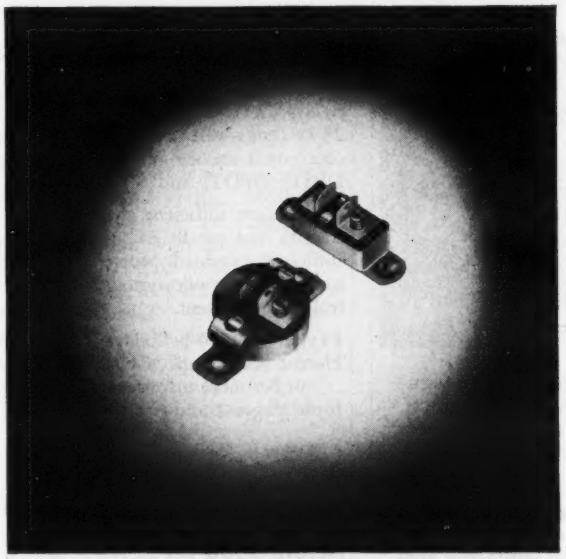
at the end of each editorial article makes it easy for you to follow-up on process-improving ideas you read about in these columns . . . saves you time. Write direct or use the handy Reader Service slip.

THE EDITORS

New Miniature THERMOSWITCH® control with many great uses

1. WHAT ARE YOU WORKING ON? Is it a project where the temperature requirements are rigid but the size of the control must be miniature? Designed first for aircraft and airborne missiles of the future, this new Fenwal Miniature THERMOSWITCH unit has the answer engineers seek . . . adjustable . . . super-sensitive . . . stable . . . all in compact and rugged form.

2. MANY USES, MANY PROBLEMS SOLVED for designers now at work on modern or "tomorrow" projects. You can set this new Fenwal Miniature THERMOSWITCH unit anywhere within the range of 0°F to 200°F. It can carry a 250 watt load and withstand vibrations up to 5 G's. Many other wanted characteristics up to now not available in devices of its size.



3. TWO TYPES . . . SAME ADVANTAGES. (*Shown actual size.*) Contacts of both break with temperature rise. Fenwal Miniature THERMOSWITCH controls for electronic devices, precision instruments, aircraft, bearing or motor overheat alarms. Designed precisely for your miniaturization projects.

4. BULLETIN describes these new "Miniatures" in greater detail, gives engineering data. Fenwal's engineering staff is always ready to help in special temperature control projects. For bulletin MC-114 pictured above write
Fenwal Incorporated, 246 Pleasant St., Ashland, Mass.

Fenwal

THERMOSWITCH®

Electric Temperature Control and Detection Devices

SENSITIVE . . . *but only to heat*

When inquiring check CP 1735 on handy form, pgs. 2-3

NOW... ALL roll and dial recording charts from ONE SOURCE

Over 8000 different charts for recording instruments can be supplied by **Technical.** This unique service means savings in ordering . . . in receiving . . . in stocking . . . and in chart costs, too.

All **Technical** charts are produced by means of precision plates cast from carefully made wax engravings. **Technical's** inventory for immediate shipment consumes over two miles of shelving.

When special charts are needed for new instruments, **Technical's** experience and equipment is at your service.

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TECHNICAL CHARTS INCORPORATED

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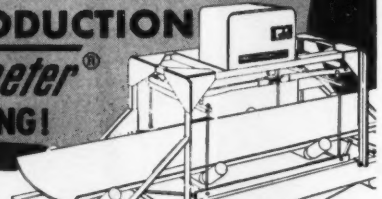
Nationally Represented by TECHNICAL SALES CORPORATION, 15464 James Couzens Highway Detroit, Michigan

When inquiring check CP 1736 on handy form, pgs. 2-3

Control YOUR CONVEYOR PRODUCTION with *Transportometer*® CONTINUOUS WEIGHING!



No more estimating tonnage figures or rehandling material for weighing. Installed on your present belt conveyor system, TRANSPORTOMETER can automatically and accurately weigh, regulate, totalize and record the flow of raw, intermediate or finished products. Whether it is storing, handling or processing, you get a more complete and precise control of your operations with resultant savings in material, time and labor.

Here's why TRANSPORTOMETER is the finest unit of its type made:

Completely mechanical gear differential integrator, automatically and continuously records on direct reading tonnage totalizer; automatic—no supervision after calibration; accurate—99½% or better, regardless of belt speed or tonnage; easily installed—unit supplied ready for mounting on new or existing belt conveyor; negligible wear and lowest maintenance cost of any comparable equipment.

Some of the Materials Weighed by the TRANSPORTOMETER:

Limestone; Coal; Coke; Metallic Ores; Sand; Stone; Cement; Clay; Paper Pulp; Super Phosphate; Chemicals; Coffee Beans; Pharmaceuticals;

TRANSPORTOMETER DIVISION

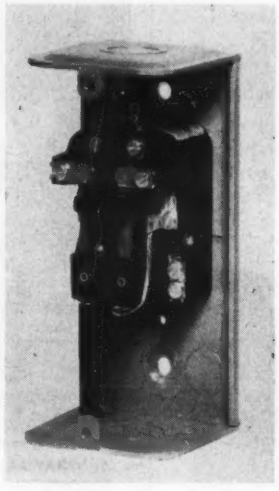
SINTERING MACHINERY CORPORATION

150 Sinter Avenue, Netcong, N.J.

When inquiring check CP 1737 on handy form, pgs. 2-3

Extend relay life with braided, repositioned shunt for minimum wear . . .

10-amp units are available for 6 to 300 volts at standard frequencies and DC



Open-form relays are built so they may be converted for various types of service

Uses: General purpose relays are rated from 6 to 300 volts at standard frequencies and direct current.

Features: Use of braided shunts and redesign of relay to put shunt into position where wear is minimum have extended relay life.

Description: Greater utility and reduction in inventory may be achieved by use of standardized open-form relays with conversion kits. Kits may be stocked separately. Conversion units are available for metal and compound base backmounting, base receptacle, and relay jack-plug applications. Kit may also include explosion-proof enclosures suitable for dust tight and Class 1, Group D service.

Relays are available with windings for 60, 50, and 25 cycles as well as DC. Contact ratings are 10 amp continuous service and contact arrangements include DPST, DPDT, and STDB.

Ratings are sufficient so that relays can be used as starters for small AC motors where motors have sufficient overload protection. They are especially suitable for application in electronic and other controlled equipment.

(Type CR2790-E Relays are products of General Electric Co., Dept. CP, Schenectady 5, New York . . . or for more information check CP 1738 on handy form, pages 2 and 3.)

No sealed bearings, no stuffing — magnet and follower isolate 5000 psi . . .

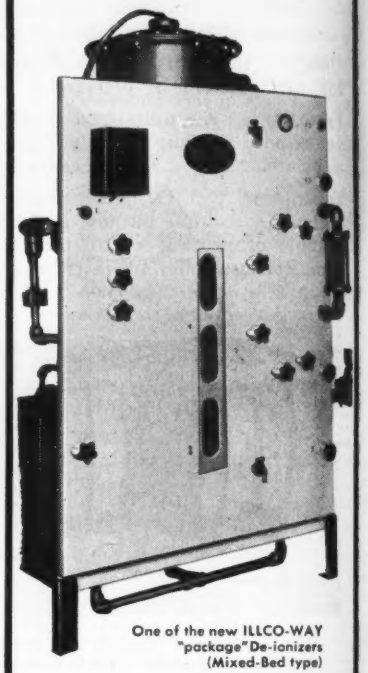
combines stainless construction with temperature compensated operation

Uses: Recorder is designed for routine operation at pressures to 5000 psi.

Features: Magnetic following arrangement between float and instrument linkage eliminates problem of pressure type bearings, lubricants, stuffing boxes, and fluid leakage.

Description: Manometer is essentially conventional U-tube mercury manometer. Float operates

De-ionized Water in a "package"



One of the new ILLCO-WAY "package" De-ionizers (Mixed-Bed type)

A complete line of standard (package-type) De-ionizers—for production of solids-free De-ionized water (flow rates from 100 to 1000 gph.). Three types: Mixed-Bed and standard two-bed, with or without silica removal. Ideal production units; convenient for laboratory and pilot-plant research.

Units are compact, shipped completely assembled and base-mounted for ease of installation and operation, requiring only connection to raw water, drain, and treated water outlets.

Send for your free copy . . .

of Bulletin PK-152, containing general unit specifications, complete description of equipment and performance data. Please write on company letterhead. Address: Illinois Water Treatment Co., 903-6 Cedar St., Rockford, Illinois.

Which package ?

ILLCO-WAY

ionXchange

When inquiring check CP 1739 on handy form, pgs. 2-3

It's Automatic!
It's Accurate!
It's Dependable!
It's Self Operated!
It's the LOW PRICED
TEMPERATURE REGULATOR

- SIMPLE, RUGGED, LOW COST, FIELD-REPLACEABLE THERMOSTATIC SYSTEM
- TIGHT SHUT-OFF; Self aligning single seated construction insures tightness.
- SUPER-POWER INSTANTANEOUS RESPONSE; Liquid expansion, throttling action, insures positive, constant control.
- OVERLOAD PROTECTION
- EXTREMELY COMPACT AND STURDY

Write for Bulletin ST-162 Today

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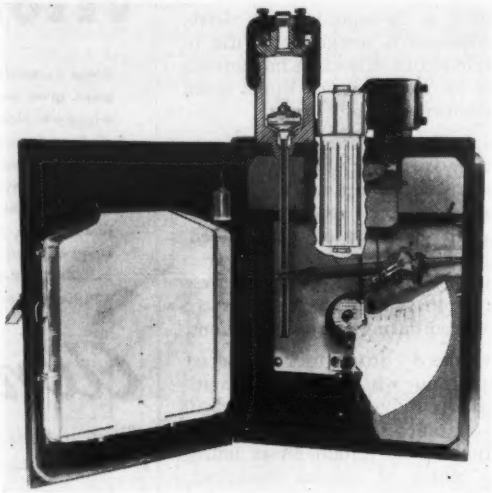
FARRIS HYDROSEAL CORP.

When inquiring check CP 1740 on handy form, pgs. 2-3

through 2-inch linear travel to provide a large mechanical signal for instrument linkage. Manometer uses relatively little mercury since relatively little force is required to move float against low friction of magnetic follower. Range tubes are available for 100, 200, and 400 inches of water — much higher differentials can also be measured.

As shown in illustration magnetic following linkage consists of lower float extension which moves in a closed, high-pressure stainless steel tube. Float



Cutaway section illustrates float and float extension which incorporates a pair of permanent magnets. Following magnets of positioning arm are thus linked to float without seals or bearings

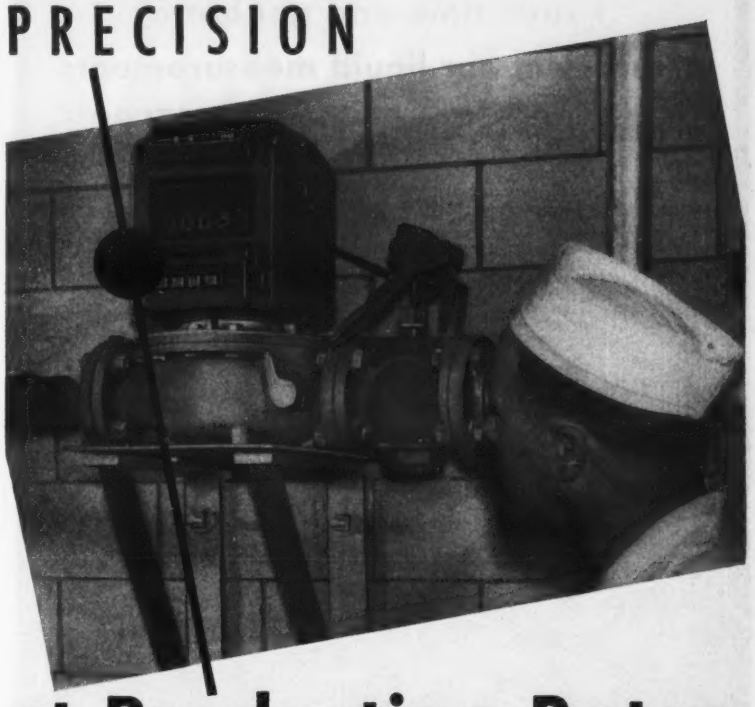
extension contains a pair of permanent Alnico 5 magnets with north poles butted together. Motion of the float is followed by a pair of bar magnets arranged in tuning fork fashion with south poles outward. These magnets, on end of follower arm, operate on frictionless bearings in a die-cast housing including a damping mechanism. Butted north poles have advantage that if float moves suddenly, south poles in proximity of follower arm magnets will repel them and bring follower arm close to north poles where attraction can attain final position.

Stainless steel internal construction resists corrosion from sour crudes and similar materials even when they are brought directly into range tubes.

Automatic temperature compensation is obtained by action of alloy rod housed within float extension. This compensates for changes in mercury density and dimensional changes of the float extension caused by varying ambient temperature. It requires no maintenance or adjustment. Construction of float causes it to seal against upper or lower O-rings in the float chamber thus providing positive check against loss of mercury on open range.

(High Pressure Mercury Manometer is designed and built by Fischer & Porter Co., Dept. CP, Hatboro, Pa. . . . or for more information check CP 1741 on handy form, pages 2 and 3.)

LABORATORY PRECISION



at Production Rates

WITH

NEPTUNE liquid METERS

Batch mixing with laboratory precision is automatic with these Neptune Auto-Stop liquid meters. You simply push buttons to set the quantity of ingredients required by formula, open the valve, and the meters do the rest. They pay for themselves by eliminating spoilage, spillage, over-filling and the fuss and muss of gauge sticks, pails or batch tanks.

The easy to read registers give you accurate, quick cost accounting figures too. The Auto-Stop is only one of many Neptune meters available for handling over a hundred industrial liquids—including water, syrups, brines, oils and many chemicals. Famous for simplicity, sustained accuracy, and low maintenance. Telephone or write our nearest branch for quick information.

SEND FOR NEW BULLETIN 566-H P . .
. . . a gold mine of information that helps select the right meter for your process.

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50 West 50th St. • New York 20, N. Y.

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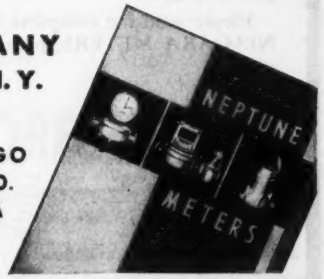
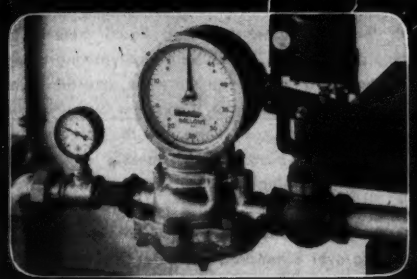


When inquiring check CP 1742 on handy form, pgs. 2-3

"I save time and get better accuracy in our liquid measurements with NIAGARA Electricontact METERS"



Commercial liquids CAN be measured quickly, simply and positively. NIAGARA Electricontact METERS assure accurate measurements through automatic control. The meter actuates a solenoid valve to stop the flow of liquid after delivery of the preset quantity. There's no friction load on the meter. NIAGARA METERS replace obsolete tanks and gauge sticks with a sure method of precise measurement.

Find out just how NIAGARA Electricontact METERS can give you the most accurate batch measurements—automatically.

Send in the Data Request blank below . . . today.

BUFFALO METER CO.
2892 MAIN STREET
BUFFALO, N.Y.

Gentlemen:

Please send me complete information on the use of economical NIAGARA METERS, based on the data below:

Liquid ..... Pressure ..... p.s.i.
Temp. ..... °F.
Flow rate ..... g.p.m.
Maximum batch ..... gals.
Name .....
Company .....
Address .....

When inquiring check CP 1743 on handy form, pgs. 2-3

INSTRUMENTATION

When variable goes wide chart drive speeds up for clear picture . . .

speeds 30 or 60 times normal "catch" wild changes

Chart drive is designed to instantly increase paper speed when variable exceeds predetermined limits. Device is especially suitable for control point adjustment during start-up or when upset occurs in process.

Called a two-speed chart drive, mechanism is designed for use in single-record strip chart instruments and for conversion of single speed instruments already in use.

Single-speed recorders, while completely satisfactory for most control systems, are sometimes too slow to make a complete record when production difficulty is encountered. If, on the other hand, they run fast enough for accuracy at these exceptional times, much chart space is wasted during normal operations.

Two-speed drive uses planetary gear train which functions automatically to produce chart speed 30 or 60 times normal when process varies beyond certain preset limits. On return of normal conditions, chart speed drops to normal also. Manual switch in new drive unit allows speed changes for precise charting of new process tests or whenever decided.

Planetary gear train provides instant speed change because gears are constantly in mesh and rotating. This, changing chart speed does not affect instrument operation.

(Two-speed Chart Drive is a development of Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Aves., Philadelphia 44, Pa. Deliveries of this newly developed device are not expected to start before August of this year. . . . or for more information check CP 1744 on handy Reader Service slip, pages 2 and 3.)

A company name and address . . .

at end of each editorial article makes it easy to follow-up on ideas you read about in these columns . . . saves you time. Write direct or use the handy Reader Service slip.

THE EDITORS

READ AIR VELOCITIES *instantly... accurately... anywhere...*

...WITH THE **ALNOR VELOMETER**

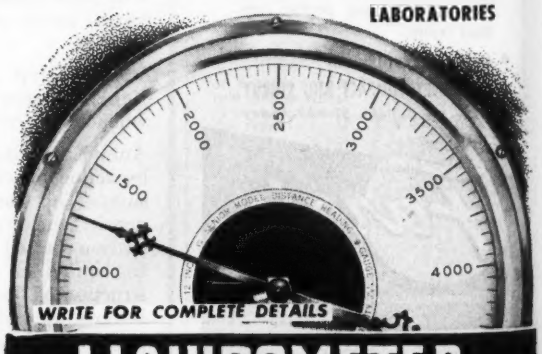
Alnor Velometer, a precision-built, self-contained, portable instrument, gives you instant, *accurate* readings of air velocities anywhere—in plants, mines, mills or laboratories. Measures speed of air flow through ducts, grilles, furnaces, spray booths or in the open. This rugged instrument needs no special care or delicate handling—anyone can use it and get accurate readings. Needs no calculations or reference charts. Available in a wide variety of scale ranges, and with a full assortment of jets and fittings for every application. You'll want full details and prices, so write for Bulletin 2448-G, Illinois Testing Laboratories, Inc., Room 504, 420 No. La Salle St., Chicago 10, Ill.

Alnor PRECISION INSTRUMENTS FOR EVERY INDUSTRY

When inquiring check CP 1745 on handy form, pgs. 2-3

"LIQUIDS WORTH STORING ARE WORTH MEASURING"
with a
LIQUIDOMETER
Tank Gauge

- FOR GAUGING LIQUIDS OF ALL KINDS
- 100% AUTOMATIC
- APPROVED BY UNDERWRITERS' LABORATORIES



WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 1746 on handy form, pgs. 2-3

STOP COSTLY WATER HAMMER NOW!

WILLIAMS-HAGER FLANGED

Silent CHECK VALVES

Williams-Hager Flanged Silent Check Valves are the economical and dependable answer to troublesome and costly "water hammer" in all pump lines. These valves operate effectively in horizontal, vertical, upside down or angular positions—under any service or pressure condition.

WRITE FOR BULLETIN WH-851

This bulletin gives complete details on the cause, effect and control of damaging "Water Hammer." Use the coupon below for prompt delivery of your copy.

CHECK VALVES

The Williams Gauge Co., Inc.

3015 Pennsylvania Ave. Pittsburgh 33, Pa.

MAIL THIS COUPON Today!

THE WILLIAMS GAUGE COMPANY, INC.
3015 Pennsylvania Avenue
Pittsburgh 33, Pa.

Please send a copy of Bulletin WH-851 on "Water Hammer, Cause, Effect and Control in Piping Systems."

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE____

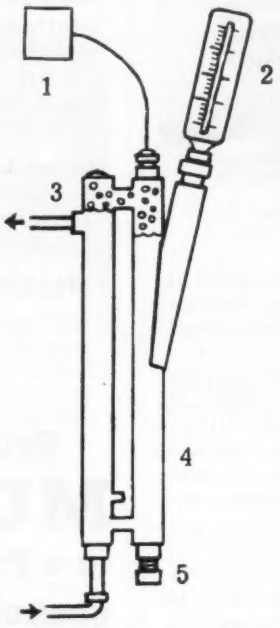
When inquiring check CP 1747 on handy form, pgs. 2-3

Novel application for thermostat finds it controlling humidity or air conditioning . . .

boiling point of solution is dependent on water pickup, thermostat senses it

Where air is dried or conditioned by passing it through an absorbent liquid, this instrument can be used for automatic control of relative humidity of the air. No moisture-sensitive element is used to determine humidity: a thermostat in the instrument serves this purpose.

Absorbent liquid in a system of this kind becomes diluted by the water it removes from air stream. Amount of moisture permitted to remain in air passing through the absorbent is governed by concentration of this liquid. Concentration, of course, has a direct relation to the boiling point of the absorbent-water mixture. And thermostat is used to sense this boiling point.



Various components of the instrument are shown in the illustration above. They are: 1) thermostat, 2) thermometer, 3) continuous flow tube, 4) boiling tube, and 5) heating element

Instrument consists essentially of a tube equipped with a heating element, a continuous sampling system, and the thermostat. Continuous flow of absorbent liquid as it comes from reconcentrator, is passed through the instrument.

Absorbent on its way back to air conditioner is raised to its boiling point. Thermostat in the tube is set at the boiling point desired. Thermostat operates the concentrator to furnish a greater or lesser concentration of the liquid as called for by instrument setting.

A change of several degrees in boiling point is reflected by a change of 1% in concentration. Thus control is accurate and results in holding relative humidity of the conditioned air close to the required tolerances.

Instrument operates independent of ambient temperature and is not subject to change in moisture sensitivity.

(Relative Humidity Controller is manufactured by Niagara Blower Company, Dept. CP, 405 Lexington Avenue, New York 17, New York . . . or reader may secure more information by simply checking CP 1748 on convenient Reader Service slip between pages two and three.)

STOP VIBRATION

Special Korfund steel spring Vibro-Isolators support 15 large compressors and vacuum pumps at Courtaulds (Canada) Limited. The installation on the mezzanine floor, for better plant layout and lower construction costs, was made possible when Korfund guaranteed no vibration would be transmitted to upset the delicate electronic controls of this modern rayon plant.

with

KORFUND VIBRATION CONTROL

Korfund Engineered Isolation permitted equipment installation in this ideal spot for best plant layout, protected the electronic controls, saved the extra cost of piling required for a basement installation, and according to Courtaulds—*more than paid for itself in reduced construction costs alone.*

For less exacting installations, there are standard stock Korfund isolators. A selector chart is available, giving recommendations for both normal and critical conditions, for pumps, compressors, centrifuges, machine tools, presses, hammers, and most other processing and mechanical equipment. Write us for your copy of Bulletin No. 10 today, or see our catalog in Sweet's Files.

We'll gladly submit recommendations without obligation. Just contact us, or the Korfund representative you'll find in most principal cities. A half-century of experience is at your disposal.

THE KORFUND CO., INC.

KORFUND VIBRATION CONTROL — SPRINGS — RUBBER — CORK

48-13E Thirty Second Place, Long Island City 1, N. Y.
In Canada: 510 Canal Bank, Ville St. Pierre, Montreal

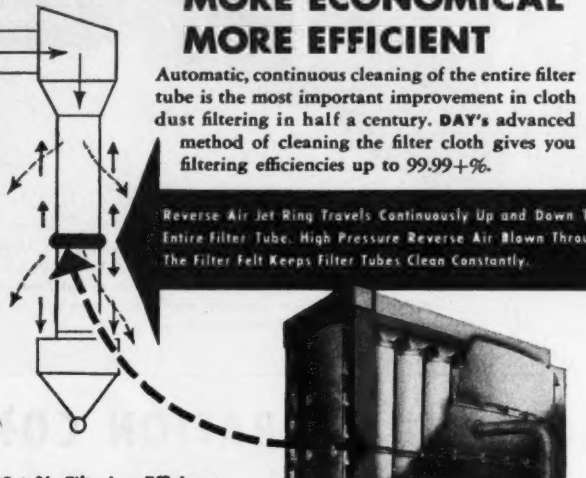
When inquiring check CP 1749 on handy form, pgs. 2-3

DAY
SINCE 1881
DUST CONTROL
A SINGLE UNIT OR A COMPLETE SYSTEM

CHEMICAL PLANTS FIND DAY HIGH PRESSURE REVERSE AIR JET CLEANING ACTION

MORE ECONOMICAL MORE EFFICIENT

Automatic, continuous cleaning of the entire filter tube is the most important improvement in cloth dust filtering in half a century. **DAY's** advanced method of cleaning the filter cloth gives you filtering efficiencies up to 99.99+%.


DAY's reverse air jet mechanism provides uniform cleaning over the entire length of the tubes.
Reverse Air Jet Ring Travels Continuously Up and Down The Entire Filter Tube. High Pressure Reverse Air Blown Through The Filter Felt Keeps Filter Tubes Clean Constantly.

99.99+% Filtering Efficiency Provides Important Savings In Reclaiming Valuable Products

DAY's improved cleaning action permits the use of a better grade wool filtering fabric which gives filtering efficiencies up to 99.99+%. This better filter cloth also allows higher air-to-cloth ratios with uniform back pressure. Plant space is saved because less filter is needed to handle equal volumes of air, and one **DAY** "AC" Dust Filter can handle four different product streams simultaneously, without mixing. It will pay you to investigate the **DAY** "AC" Dust Filter for your dust control program.

LICENSED BY W. J. HERSEY, JR.

The **DAY** *Company*
852-3rd Ave. N. E., Minneapolis 13, Minn.
IN CANADA: P. O. Box 70Y, Ft. William, Ont.
Branch Plants: Buffalo, Ft. Worth, Welland, Ont.

Send Coupon Now for Free Booklet on Dust Control with Comparison Charts.

GENTLEMEN: *Please send Dust Control Bulletin 528 of facts, figures and charts.*

Name_____

Company_____ Title_____

Address_____

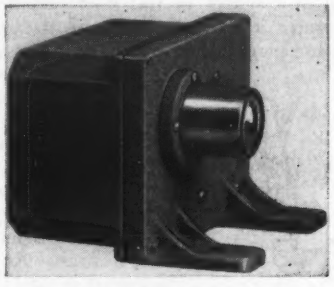
When inquiring check CP 1750 on handy form, pgs. 2-3

Spare filament of lamp keeps photo system working . . .

burnout of first filament flashes warning light

Uses: Photoelectric light source is used with conventional inspection or counting systems.

Features: Second filament in lamp provides uninterrupted service when first filament fails. Lamp comes on automatically and a signal light on housing flashes to warn operator that lamp should be replaced.



Operates on low voltage for distances to five feet

Description: Dual-filament light source is housed in a splash-proof case of cast aluminum. It does not allow photoelectric control to be interrupted, thus eliminates shut-downs, inconvenience, etc.

Light source also prolongs lamp and tube life by using lower voltage than usual when distance between light source and photo amplifier is less than 5 feet.

(L4 Light Source is a product of The Autotron Co., Dept. CP, Box 722-S, Danville, Ill. . . . or for more information check CP 1751 on handy form, pages 2 and 3.)

Resolution is 0.03% in 3 w, 360° linear potentiometer . . .

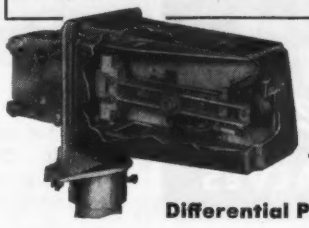
shaft torques are as low as 0.025 ounce-inch

Uses: 360° potentiometer rated at 3 w is suitable for control or measurement of angular position.

Features: Shaft torques as low as 0.025 ounce-inches can be used to position arm of this potentiometer.

Description: Potentiometer was developed for use in computers

FLOW MEASUREMENT SIMPLIFIED!



With the New Taylor TRANSAIRE® Differential Pressure Transmitter

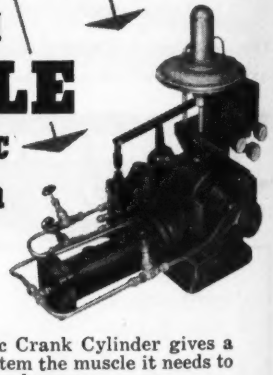
A STREAMLINED, light-weight pneumatic transmitter, designed to meet present day requirements for a rugged, dependable and accurate instrument to measure flow, liquid level, or specific gravity. Compact design, force-balance action, dry (mercuryless) type. Ten-to-one adjustability in each of two ranges: 20-200" water; 80-800" water. Inexpensive, simple to install. Economical and easy to maintain.

Ask your Taylor Field Engineer for full details of this new transmitter, or write for **Bulletin 98226.** Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Reg. U. S. Pat. Off.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

When inquiring check CP 1752 on handy form, pgs. 2-3

How to add MUSCLE to a Pneumatic Control System



Askania Pneu-Draulic Crank Cylinder gives a pneumatic control system the muscle it needs to operate large valves or dampers.

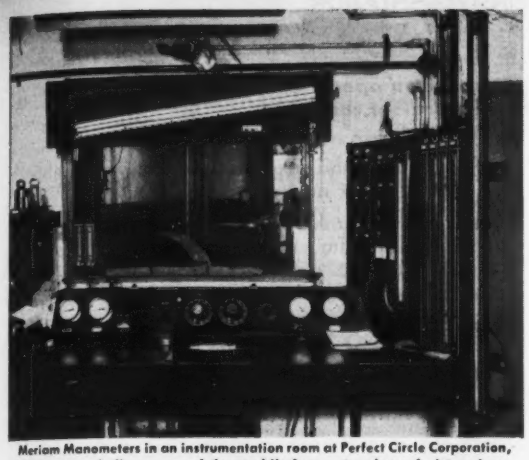
It transforms the 3-15 p.s.i. signal from a pneumatic controller into high-torque hydraulic power for positive, fast, precise positioning of butterfly valves, plug valves, or other control elements.

The Askania Pneu-Draulic Crank Cylinder is compact. Takes up less room than other types of equipment. Moreover, hydraulic operation is inexpensive.

This is one of several Askania units designed to add muscle to pneumatic control systems. Form 1-87 describes the Pneu-Draulic Crank Cylinder; Form 1-86 describes the Pneu-Draulic Slide Valve Positioner. Ask for both papers.

ASKANIA REGULATOR COMPANY
242 E. Ontario Street Chicago 10, Illinois
Subsidiary of General Precision Equipment Corp.

When inquiring check CP 1753 on handy form, pgs. 2-3



Meriam Manometers in an instrumentation room at Perfect Circle Corporation, Hagerstown, Indiana, one of the world's foremost makers of piston rings.

Perfect Measurement at PERFECT CIRCLE by MERIAM MANOMETERS

• At Perfect Circle Corporation, Meriam Manometers measure various pressures and pressure differentials — functions of air flow, fuel flow, oil flow, crank case pressure, exhaust back pressure, water flow, and similar variables encountered in internal combustion engines while testing piston rings.

Meriam Manometers are specified in nine engine test cells at Perfect Circle Corporation because they can be applied to very low pressure differentials and because of their inherent accuracy, sensitivity and independence of mechanical failure.

If your instrumentation problems are complicated by varying ranges of pressure differentials, possibly the answers are Meriam Instruments. They are primary standards for indicating measurements of pressures or flows of liquids or gases.

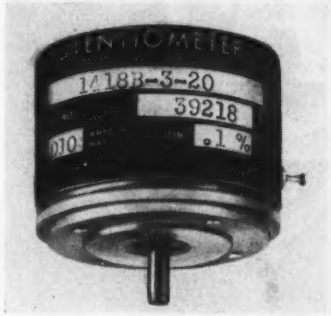
We shall gladly share our more than 40 years of experience. Request Bulletin C-12.

THE MERIAM INSTRUMENT CO.
10940 Madison Avenue • Cleveland 2, Ohio
WESTERN DIVISION: 4760 E. OLYMPIC BLVD., LOS ANGELES 22, CALIF.
IN CANADA: PEACOCK BROS., LTD., MONTREAL

MERIAM ★ Instruments ★
ESTABLISHED 1911
MANOMETERS, METERS AND GAUGES FOR THE ACCURATE MEASUREMENT OF PRESSURES, VACUUMS AND FLOWS OF LIQUIDS AND GASES

When inquiring check CP 1754 on handy form, pgs. 2-3

and similar equipment. Employing servo type mounting, unit has ball bearing shaft which accounts



Diameter is just under 1½ inches

for very low torque requirements. Shaft and mounting flanges are maintained to close tolerances (a few ten-thousandths of an inch) so that potentiometer can be built into precision equipment as an integral component.

Available resistance values run from 100 to 350,000 ohms and electrical rating is 3 watts. A variety of tap and brush designs is available. Linearity is 0.1% and resolution of the instrument is 0.03%. Toroidally wound resistor element is 3¾ inches long.

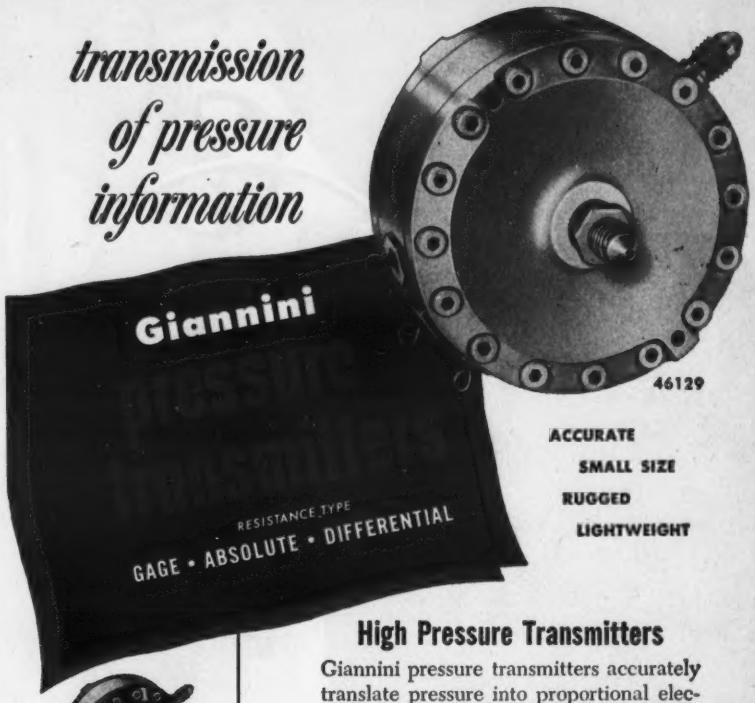
Total instrument measures 1.437 inch, diameter is just over one inch long (exclusive of shaft). Color coded leads or screw-type terminals can be furnished in place of solder terminals which are usually used.

(Potentiometer is built by Electro-Mec Laboratory, Dept. CP, 19 Murray St., New York 7, N. Y. . . . or for more information check CP 1755 on convenient Reader Service slip, pages 2 and 3.)

Viscosity instrumentation

Details of recording and controlling systems for viscosity using Ultra-Viscoson are given in four-page data sheet. Specifications and system schematics are included. Data Sheet 10.13-2 is issued by Station 64, Brown Instruments Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Aves., Philadelphia 44, Pa. When inquiring specify CP 1756 on handy form, between pages two and three.

transmission of pressure information



ACCURATE
SMALL SIZE
RUGGED
LIGHTWEIGHT

46139

46118

46119

High Pressure Transmitters

Giannini pressure transmitters accurately translate pressure into proportional electrical signals of relatively high power — signals, that require little or no amplification for utilization. These high pressure transmitters incorporate a unique, direct-coupling arrangement between bourdon tube and potentiometer element which obtains movement amplification without the use of gearing or linkage, thus giving high sensitivity, repeatability, and low hysteresis. Specific models are available for operation under either normal or extreme conditions of vibration and acceleration.

Models also available for low pressure and high altitude applications.

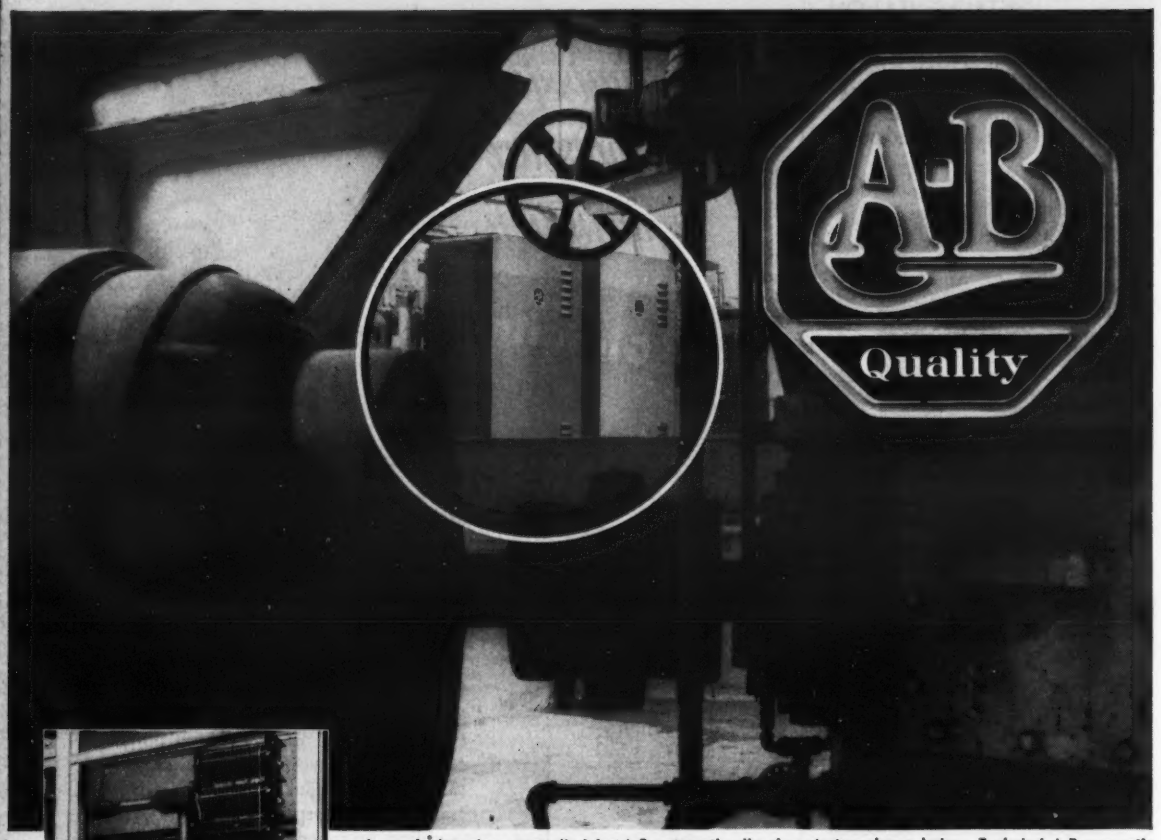
MODEL	WEIGHT	GAGE	ABSOLUTE	DIFFERENTIAL
* 46129	0.75 lbs.	0-100 psig up to 0-600 psig	15-100 psia up to 15-600 psia	0-100 psid up to 0-600 psid
46118	0.3 lbs.	0-100 psig up to 0-6500 psig	0-100 psia up to 0-500 psia	0-100 psid up to 0-600 psid
* 46119	0.6 lbs.	0-100 psig up to 0-6000 psig	0-100 psia to 0-600 psia	0-100 psid to 0-600 psid
46139	0.75 lbs.	0-100 psig up to 0-6500 psig	NONE	NONE

Standard Resistance 2,000 ohms. * For Corrosive Media. For specific values of linearities, resolution, repeatability and hysteresis, write for bulletins.

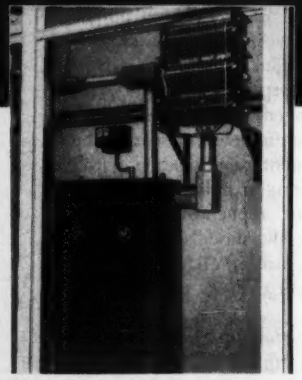
Giannini INSTRUMENTS CONTROLS

G. M. GIANNINI & CO., INC. PASADENA 1, CALIF. EAST ORANGE, NEW JERSEY

When inquiring check CP 1757 on handy form, pgs. 2-3



Large hydrapulper controlled by A-B automatic slip ring starter, shown below. Encircled A-B magnetic resistance starters control the feeder stock pumps on this installation.



Close-up view of Allen-Bradley Bulletin 761 Automatic Slip Ring Starter, controlling the 200 hp motor driving the large hydrapulper above.

Large Hydrapulper

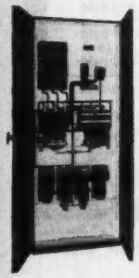
equipped with

ALLEN-BRADLEY TROUBLE FREE MOTOR CONTROLS

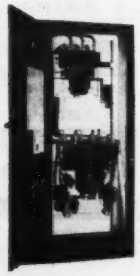
In this large eastern paper mill, Allen-Bradley motor controls are popular for use on such units as Jordan's, vacuum pumps, boiler feed pumps, fans, hydrapulpers, and feeder stock pumps. Reliable operation is the reason for such popularity.

The decision to use Allen-Bradley starters for your plant or on your equipment is a sound one. Their simple design guarantees millions of trouble free operations. Likewise, the double break, silver alloy contacts require no maintenance. Dependable overload relays are easily reset. Safe enclosures for every kind of control job are available. Consult with Allen-Bradley, today.

Allen-Bradley Co., 104 Greenfield Ave., Milwaukee 4, Wis.



Allen-Bradley Bulletin 761 Automatic Slip Ring Starter. Note the neat wiring . . . roomy control panel.



Allen-Bradley Bulletin 740 Magnetic Resistance Type Starter. Graphite disc resistors provide velvet smooth motor acceleration.

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

When inquiring check CP 1758 on handy form, pgs. 2-3

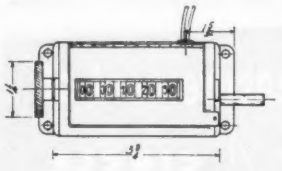
Shuts down operations when pre-set count is reached . . .

both rotary and stroke counters built as right- and left-hand models

Uses: Both stroke and rotary models may be pre-set to any number to 99,999. When pre-set count is reached contacts are thrown to signal or stop operations.

Features: Both rotary type and stroke model are furnished for right or left hand drive, clockwise or anti-clockwise rotation.

Description: Five-digit, pre-set counters are entirely enclosed for protection against dust and moisture. Compact, they have overall dimensions of 4⅜ x 2⅛ x 2⅝ inches high. Weight is 1¾ pounds. Predetermined count may be set for any figure within range of counter by lifting hinged metal cover. Individual predetermined number wheels are easily set by thumb.



Top view of rotary counter

(SP Productimeters are manufactured by Durant Manufacturing Co., Dept. CP, 1951-A North Buffum St., Milwaukee 1, Wis. . . . or for more information check CP 1759 on handy form, pages 2 and 3.)

Using pressure transmitters to detect flooding of columns . . .

force-balance transmitters report changes in pressure drop over a narrow range

Instrumentation and control of "super-fractionating" columns (i.e. high capacity, high efficiency columns making close separations of hydrocarbons) has been designed and operates satisfactorily. These instrument systems, however, deal with external functioning of the column (feed and reflux rates, heat input, etc), and internal conditions such as liquid level, temperature, and pressure.

Until recently, measurement and control of pressure drop across the column has been only partially successful. Pressure drop measurement can warn operator in advance when flooding conditions are being approached, thus can make it possible to operate column at maximum safe load with greater throughput.

Results of a study by Gordon W. Swinney have recently been made available (see below) and indicate that a force balance pressure transmitter will perform this job.

Three considerations in selecting an instrument for measuring pressure drop are: range span, sensitivity (and accuracy), and adaptability. *Range span* is a factor since pressure drop usually falls in the 0 to 20 psi range — and more usually in the 10 to 15 psi range. This drop must be measured in a column

Engineered for tough service

THIS TUBE-TURN Welding Neck Flange will contain greater pressures under temperature extremes, and will last longer than other types under repeated bending or vibrations of piping. It is *engineered* for tough service . . . with a long, tapered hub, and a smooth transition in thickness to the pipe-end bevel.

You can select the exact Welding Flanges you require from TUBE TURN's complete line: welding neck; slip-on; lap joint; socket welding; blind; orifice; or pipeline non-standard flanges. It *pays to specify* TUBE-TURN Welding Fittings and Flanges. Call your nearby TUBE TURNS' Distributor . . . you'll find one in every principal city.

Be sure you see the double "tt"

TUBE TURNS, INC. LOUISVILLE 1, KENTUCKY

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Chicago • Houston • Tulsa • San Francisco • Los Angeles • Denver • Atlanta

Subsidiaries: TUBE TURNS OF CANADA LIMITED, CHATHAM, ONTARIO • PENNSYLVANIA FORGE CORPORATION, PHILADELPHIA, PA.

ENGINEERING SERVICE

TUBE TURNS' *Engineering Service*
HELPS DEVELOP NEW PIPING TECHNIQUE

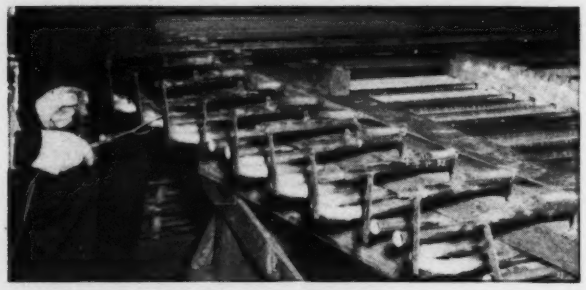
D. R. Cheyney, of TUBE TURNS' Engineering Service Division, has had wide experience in alloy and non-ferrous applications.

THIS STORY of how a large processor saved $50,000 and conserved scarce copper with a new approach to a piping application shows why TUBE TURNS, INC. is so highly regarded as an authority on piping engineering.

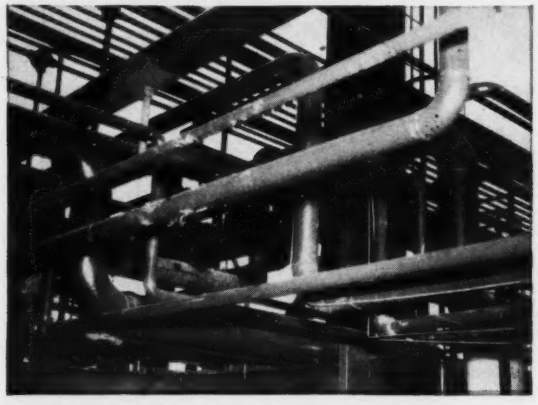
The problem involved the retubing of seven cooling units, formerly fabricated from copper tubing and fittings. Aluminum was considered as a replacement; however, there were no satisfactory methods for welding thin-walled aluminum tubing to welding fittings. TUBE TURNS' Engineering Service Division, working with Alcoa, came up with the solution. A new brazing technique was developed, and special TUBE-TURN Welding Returns, and TUBE-TURN Welding Elbows were supplied.

TUBE TURNS' Engineering Service is ready to help *you* in such special applications.

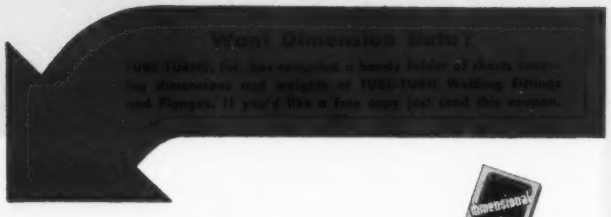
SPEEDS FABRICATION—TUBE-TURN Welding Fittings have won a reputation for dimensional accuracy that pays off in fast, easy alignment and fabrication. Time often is saved by welding assemblies in the shop, quickly tying them into the job.



TUBE-TURN aluminum long-radius Welding Returns being brazed to aluminum tubing, in fabrication of cooling coils.



SAFE AND SURE—Refinery piping *must* be reliable and leakproof. Forged-in strength of TUBE-TURN Welding Fittings assures safe, leakproof joints.



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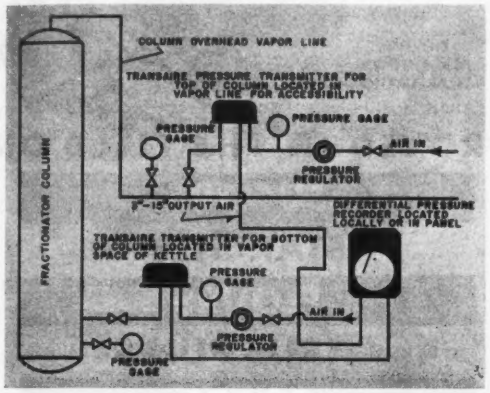
TUBE TURNS, INC.
LOUISVILLE 1, KENTUCKY

which can be operating at a static pressure as high as 1000 psi. Need for *sensitivity and accuracy* is obvious in looking for such a small pressure relative to pressure in the column. *Adaptability* covers ability of the instrument to operate year 'round without special precautions.

Three types of instruments have been tried in this service. Differential instruments fail because of excessive size of manometer tubes and non-adaptability. Spring-balance types are not sensitive enough unless operating pressure in the tower is 50 psig or less. Pressure drop is a minor quantity at pressures higher than 50 psig.

Force-balance instruments, on the other hand, can be constructed to measure a narrow span of 0-20 or


COLUMN OVERHEAD VAPOR LINE
TRANSAIRE PRESSURE TRANSMITTER FOR TOP OF COLUMN LOCATED IN VAPOR LINE FOR ACCESSIBILITY
PRESSURE GAGE
PRESSURE GAGE
AIR IN
PRESSURE REGULATOR
3-15 OUTPUT AIR
DIFFERENTIAL PRESSURE RECORDER LOCATED LOCALLY OR IN PANEL
FRACTIONATOR COLUMN
TRANSAIRE TRANSMITTER FOR BOTTOM OF COLUMN LOCATED IN VAPOR SPACE OF KETTLE
PRESSURE GAGE
AIR IN
PRESSURE REGULATOR
PRESSURE GAGE

Components and hook-up for differential pressure measurement by force-balance transmitters

0-40 psi within a large range. Sensitivity and accuracy are good. And the instrument is suitable for year around operation without special precautions. In using force-balance instruments, range should be narrowed down to 0-20 psi. One transmitter is located at top of column, the other at foot. Both transmitters must have the same range span since receiver measures difference in output signal which is 3 to 15 psi for any range span. Before installation, transmitters and receiver should be checked for calibration.

Besides obvious operating benefits from such a system, Mr. Swinney has suggested that this general method may be useful in automatic control problems involving fractionating columns. He suggests that this technique may make it possible to gather engineering data on flooding as an aid in column design.

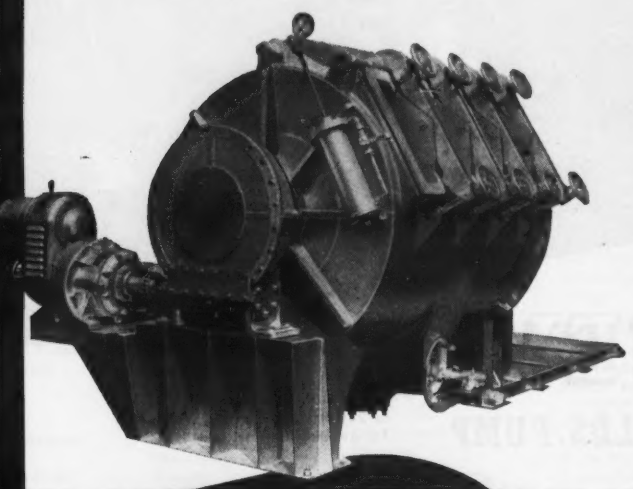
(Mr. Gordon W. Swinney's work is presented in Instrument Society of America paper No. 52-15-1 and may be obtained by remitting 50c direct to ISA, Dept. CP, 1319 Allegheny Ave., Pittsburgh 33, Pa.)

(Transaire force-balance transmitter is a product of Taylor Instrument Co., Dept. CP, Rochester 1, N. Y. . . . check CP 1760, pgs. 2 & 3.)

For more information on product at left, specify CP 1761 . . . see information request blank between pages 2 and 3.

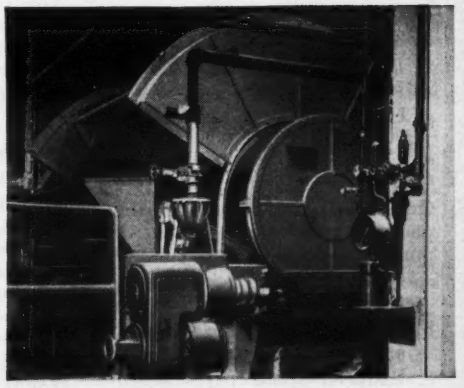
dependable process equipment built to fit your needs

Conkey Rotary Leaf Pressure Filters stay closed throughout operating cycle—you save on cloth and labor!



CONKEY FILTERS FOR CHEMICALS

Conkey Rotary Disc Vacuum Filters clarify, wash solubles from solids and dewater.



Conkey Rotary Drum Vacuum Filter is a continuously operating filter for dewatering solids and washing solubles from accumulated solids.

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN

Process Equipment Division

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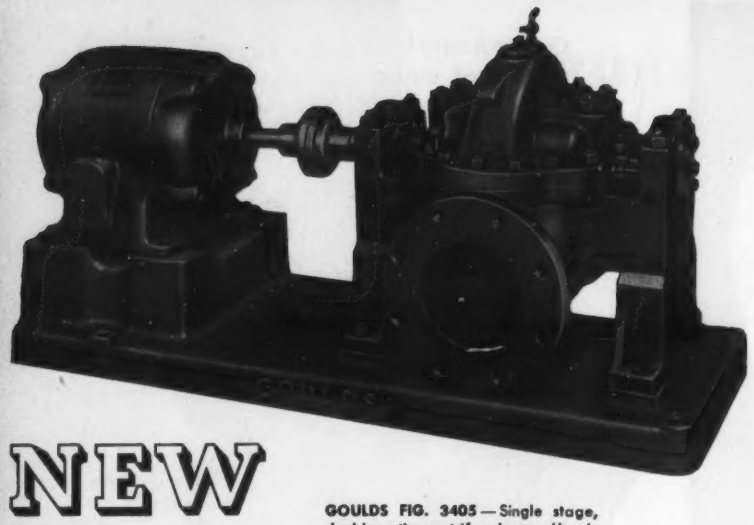
When inquiring check CP 1762 on handy form, pgs. 2-3



NEW GOULDS PUMP

GOULDS FIG. 3405 — Single stage, double suction centrifugal pump. Heads to 260 ft. Capacities to 6400 G.P.M. For general purpose pumping.

GIVES YOU 5 BIG COST ADVANTAGES

1 ***Combines seven design features that mean high operating efficiency and low maintenance.***

Every one of the following construction features is standard with this new design:

a. Renewable stuffing box bushings.
b. Bearing housings sealed against moisture and dirt.
c. Cowl-type glands suitable for use with quenching liquid.
d. Stainless-steel impeller keys.
e. Teflon water-seal rings.
f. Die-formed stuffing box packing.
g. Corrosion-resistant gland bolts.

2 ***Interchangeability of parts.***

Only three shafts and rotating parts assemblies provide for 19 pump sizes. This means you get:

a. Great flexibility in making field changes.
b. Low initial cost due to standardization of manufacture.
c. Reduced spare parts inventories.

3 ***Saves floor space.***

Short bearing spans cut over-all lengths as much as 50%.

4 ***Flexibility of stuffing box.***

You can use either conventional stuffing boxes or mechanical seals —and change from one to the other.

5 ***Easy rotation change.***

You can change from right- to left-hand rotation or vice versa in the field without construction change because of an unique device locking shaft sleeves.

GET FULL DETAILS **from the 12-page illustrated bulletin, No. 721.6, covering the complete details of the new Goulds Fig. 3405, including specifications, interchangeability tables and performance curves. Be sure you have the whole cost-advantage story before you select another general purpose pump. Contact your nearest Goulds representative or write to Goulds Pumps, Inc., Seneca Falls, N. Y.**

MEMBER

Goulds PUMPS INC. Seneca Falls New York

When inquiring check CP 1763 on handy form, pgs. 2-3

INSTRUMENTATION

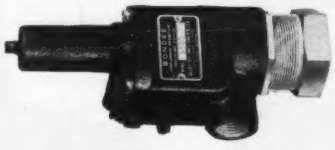
3 psi switches 15 amp in unit that's safe at 3000 psi . . .

operating differential is about 7.5% in factory-set switch

Uses: Switch capable of handling 15 amp will throw at signal pressures above 3 psi. It can be set for any point within its range.

Features: Switch is safe for operations with maximum pressures running to 3000 psi.

Description: Totally enclosed switch is housed in cast aluminum alloy. (A stainless model is also made.) It may be precisely adjusted without interfering with working mechanism. Current handling ability is 15 amp at 125 to



Maximum dimension is 7½ inches

460 volts AC with normally open or closed single pole or double pole with single or double throw action. Direct current switches are also available.

Pressure element is sensitive to low operating pressure and calibration is not affected by acceleration. Set point can be adjusted over entire range and will repeat accurately.

On and off differential is about 7½% of working pressure.

(Bondee Series 100 Switches have been developed by Alloy Bellows Engineering Co., Dept. CP, 18125 Roseland Road, Cleveland 12, Ohio . . . or for more information check CP 1764 on form, pages 2 and 3.)

Turns out electrical signal directly proportional to pressure . . .

output is linear and accurate to 1 part in 300

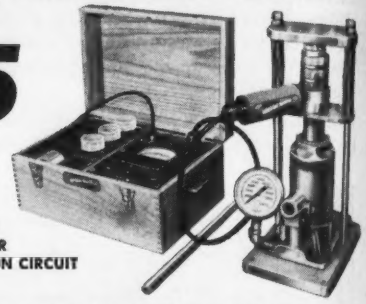
Uses: Pressure-operated potentiometer produces an electrical signal directly proportional to pressure in the barometric range of 0-15 psi absolute.

Features: Unique construction houses potentiometer winding and mechanism hermetically sealed in a vacuum compartment. Thus zero

A 1 MINUTE MOISTURE CHECK

INSURES QUALITY OF PRODUCT WHEN YOU USE THE

NEW MOISTURE REGISTER G5



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Moisture Register testing equipment is the standard in moisture testing for all industries.

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Please send me complete information on MODEL G5 MOISTURE REGISTER. I want to test _____ (MATERIAL)

NAME _____ TITLE _____

COMPANY _____ ADDRESS _____

CITY _____ STATE _____

When inquiring check CP 1765 on handy form, pgs. 2-3

Eliminate...

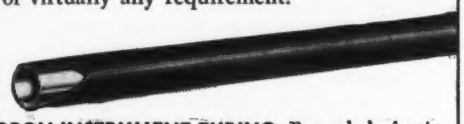
FREQUENT REPLACEMENT COSTS

With

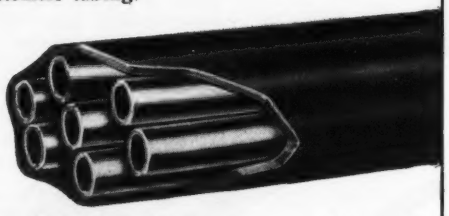
CORROSION-PROOF

Dekoron Instrument Tubing

• **DEKORON®** process of extruding a thick plastic sheath over instrument tubing makes the tubing corrosion proof . . . ends your corrosion problems *once and for all.* This means you eliminate the high cost of renewing expensive copper or alloy tubing . . . eliminate replacement costs . . . eliminate maintenance . . . conserve critical materials. Dekoron corrosion-proof instrument tubing is available in three different forms to take care of virtually any requirement.



DEKORON INSTRUMENT TUBING. Extruded plastic coating over metal tube makes it impervious to moisture, corrosion, salt air, oils, acids, and alkalies. Available in straight lengths up to 20 ft., coils up to 1000 ft., or as coating service for customers' tubing.



IMPERVAPAK METL-COR. Instrument tubing harness composed of 4, 7, or 10 copper or aluminum tubes over which is extruded thick coating of high-molecular-weight polyethylene. Available in lengths up to 100 ft.

IMPERVAPAK POLY-COR. Composed of 4, 7, 10, 14, or 19 flexible polyethylene tubes over which is extruded 1/16 inch sheath of vinyl plastic. Tubes will carry all standard line pressures. Individual tubes are color coded for easy line identification; lengths to 500 ft. A-6477

Dekoron® tubing

SAMUEL MOORE & COMPANY

Dekoron Tubing Division

MANTUA • OHIO

When inquiring check CP 1766 on handy form, pgs. 2-3

reference pressure is provided and is unaffected by temperature change. Design also protects potentiometer against dust, fungus, humidity.

Description: Mechanism consists of hydraulically formed bellows which move wiper 0.25 inch across 300 wires of potentiometer winding. Bellows spring constant is low compared with that of linear restoring spring so that excellent linearity and low hysteresis are

"Vacuum sealed" design results in life of one million cycles

achieved. Mechanical amplification of two is maintained without use of bearings. Liquid or gas being measured does not contact the potentiometer winding. High contact force of wiper on winding assures electrical contact even though instrument is subject to vibration.

Accuracy of transmitter is 2% of full scale. It measures 2½ x 2 inches diameter and has a resistance of 7500 ohms. Up to 75 volts may be applied continuously.

In operation, pressure fluid enters and causes bellows to exert a force against precision reference spring. Spring is stiff compared to bellows so resulting motion is not largely influenced by the bellows spring characteristics. Motion produced is linked by flexing linkage which doubles motion. Tests indicate that winding life of 1,000,000 scale cycles is reasonable.

Design has low hysteresis — less than 1% of full scale where vibration is applied. Resolution is 1/3% (one wire in 300).

(Type 71-5 Baroresistor is a development of Trans-Sonics, Inc., Dept. CP, Bedford Airport, Bedford, Mass. . . . check CP 1767, pages 2 and 3.)

Wanta pump something at lower cost?

CHECK HERE

Air	Dye Solutions	Latex	Salt Water
Alcohol	Edible Oils	Mash	Shortening
Ammonia	Ethane	Methane	Sludge
Beer	Fish Oils	Milk	Soap
Benzol	Formaldehyde	Molasses	Sodium Chloride Solution
Boiler Feed Water	Fresh Water	Naptha	Sodium Silicate
Brewer's Mash	Gas, Manufactured	Nitric Acid	Sodium Sulfate Solution
Butter	Gas, Natural	Nitrogen	Starch
Butane	Gasoline	Oil, Crude	Sulphuric Acid
Cane Syrup	Glucose	Oil, Refined	Sump Water
Calcium Carbonate Slurry	Glue	Oxygen	Sweet Water
Calcium Sulfate Slurry	Glycerine	Paint	Tomato Juice
Casein Solutions	Glycols	Potassium Hydroxide	Varnish
Cement Slurry	Hydrochloric Acid	Propane	Vinegar
Chocolate	Hydrofluoric Acid	Raw Boiler Feed Water	Viscose
CO_2 Gas	Ink	River Water—Dredging Operations	Water (various)
Crude Oil	Jam	Rosin	Wax
Dairy Products	Jelly		Whey
	Ketchup		
	Lacquer		

THIS list of fluids will give you a rough idea of the diversity of pumping jobs in which Darcova Pumcups are responsible for really *big* savings.

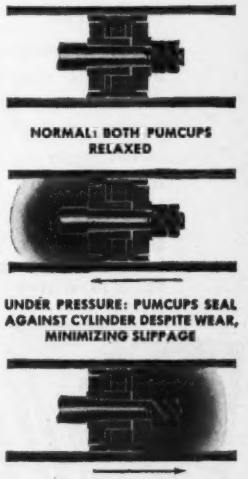
It boils down to the fact that Pumcups all but eliminate fluid slippage *throughout* their life span . . . and they *last many times as long as other packings.* Think of the down-time avoided, the production gains due to prolonged high efficiency, and the time-and-money-saving reduction in maintenance!

Years of application research have gone into the development of Pumcups. Made today in standard as well as many special compositions and textures for a wide range of temperature and pressure conditions, they offer you superior cost-cutting service in virtually *any* pumping job, simple or tough! And they're available in diameters from 1 to 20 inches.

SEND FOR FREE BULLETIN

Why not weigh *all* the facts? Bulletin 4401 covers Darcova Pumcups for reciprocating pumps; Bulletin 4502 on Pumcups for air or hydraulic mechanisms. Write for yours today.

DIAGRAM OF DARCOVA PUMCUP ACTION (greatly exaggerated)



NORMAL: BOTH PUMCUPS RELAXED

UNDER PRESSURE: PUMCUPS SEAL AGAINST CYLINDER DESPITE WEAR, MINIMIZING SLIPPAGE

DARLING VALVE & MANUFACTURING CO.

WILLIAMSPORT 4, PA.

DARCOVA® THE ORIGINAL COMPOSITION CUP

PUMCUPS

When inquiring check CP 1768 on handy form, pgs. 2-3

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WHICH type of Stainless Tubing to use? WHERE?

● Here, in 28 pages of technical information and data, you'll find what you need to help design Republic ELECTRUNITE Enduro Stainless Steel Tubing into your process equipment.

Tables of properties, corrosion-resistance, and size ranges will help you use this strong, concentric stainless tubing for all its money-saving advantages . . . longer life, uniform ductility and roundness, uniform wall thickness.

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REPUBLIC STEEL

ELECTRUNITE®
STAINLESS STEEL TUBING AND PIPE

When inquiring check CP 1769 on handy form, pgs. 2-3

Ultrasonics homogenization becomes practical

Flow of liquid against blade edge builds up local pressures of 30,000 psi as vibrations sweep out cavities in flow

Cut-away view shows principle. Liquid is pumped at 150-250 psi through narrow slit against blade edge. Flow vibrates blade at its own high frequency. Continuous cavitation in liquid results in local pressures in range of 30,000 psi. Energy from short wave vibration gives violent mechanical dispersion

Ultrasonic homogenizer is portable, clamps on mixing vat. Liquid is drawn through suction pipe (longer tube) by pump, then forced against vibrating element in resonant bell at end of discharge tube. Pipes are 2'6" long

NEW homogenizer developed in England uses cavitation principle to generate ultrasonic power at relatively low operating cost. Machine has been used in Europe to homogenize and emulsify such food products as mayonnaise, soups, spaghetti sauce, synthetic cream, margarine emulsions, toffee, and others. It is also being used in the chemical and textile industry to produce emulsions.

Operation is simple: liquid is pumped through nozzle against a blade edge enclosed in a resonant bell (see cutaway view). Blade, vibrating at its own natural frequency, sweeps momentary vacuum in liquid flow. As the liquid stream breaks vacuum, local pressures in order of 30,000 psi are developed, producing finely dispersed particles.

Machine consists of 2 hp motor and pump, two stainless steel pipes to circulate liquid, and the metal bell enclosing nozzle and blade. It is portable, and is clamped to side of mixing vat, with suction pipe and bell under surface of liquid. Mixture enters suction pipe, goes through pump into delivery pipe. Pump maintains pressure of 150 to 250 psi, forcing liquid through slit in nozzle within bell, against blade edge.

Emulsification takes place when cavities are swept

This unit in an English chemical plant is used for both oil/water and water/oil emulsions

out by oscillation of blade at high frequency (30 kc), producing short waves of high energy value. Pressure is generated on collapse of these cavities.

Simple mechanical construction allows low initial cost, easy maintenance. Internal parts may be dismantled for cleaning in 1 min.

Particle sizes as small as 1 micron are possible, according to manufacturer. Emulsions produced would thus tend to be highly stable. Less stabilizing additives would be required, and in some cases, no emulsificants would be needed.

Output is rated at 300 to 420 gal/hr. Various viscosities may be handled by adjusting by-pass valve to control rate of flow through pump.

Unit can be operated in any position, from vertical to horizontal. All contact parts are of corrosion-resistant alloys. A filter protects vibrating element from foreign particles.

(Rapisonic Homogenizer, pat. pending, is distributed in US by American Ultrasonics Co., Dept CP, 198 Pacific St., Newark, N. J. . . . or for more information check CP 1770 on handy form pages 2 and 3.)

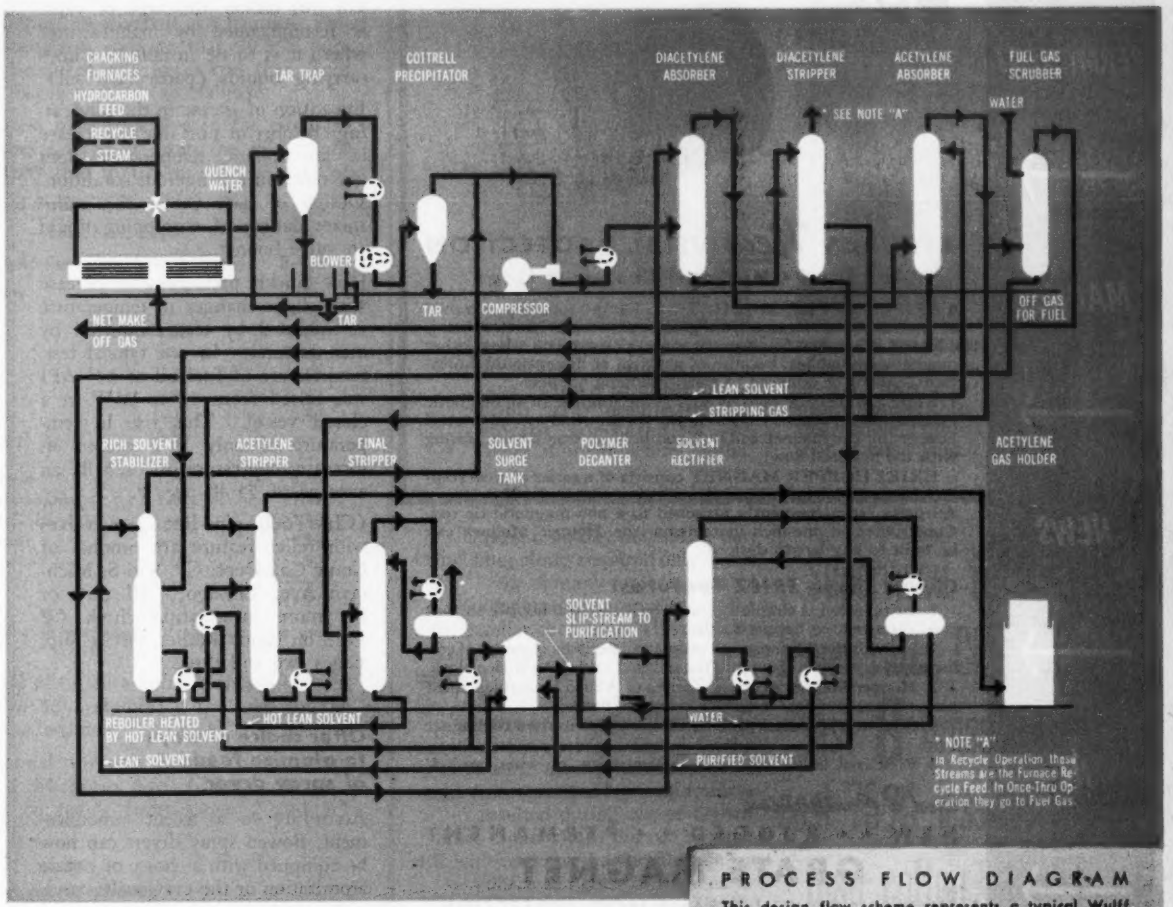
Petroleum measurement tables published

Recently published is the ASTM-IP Petroleum Measurement Tables, prepared jointly by the American Society for Testing Materials and the Institute of Petroleum (Great Britain). The tables have been developed specifically to meet the needs of all those concerned with purchase, sale, consumption, and handling of petroleum.

Following editions are available: American ($8.75, 544 pages), British ($7.00, 432 pages), and Metric ($7.70) by remitting directly to American Society for Testing Materials, Dept. CP, 1916 Race Street, Philadelphia 3, Pennsylvania.

NOW—ACETYLENE
FROM HYDROCARBON FEED
via the Wulff Process

With heavy demands for the hundreds of petrochemical end products that may be synthesized from acetylene, the need for low-cost acetylene as a raw material is becoming urgent. The Wulff Process now answers this need with a high purity acetylene at the lowest cost ever offered by any process. Any petroleum hydrocarbon conveniently vaporizable can be used as a feed stock. Recent operations of the Wulff Process have proved it to be technically sound and commercially attractive. If your plant is convenient to a source of natural gas, ethane, propane, etc., it will pay you to investigate the possibilities of manufacturing acetylene economically by the Wulff Process.



PROCESS FLOW DIAGRAM

This design flow scheme represents a typical Wulff Process plant for producing low-cost acetylene at 99+ volume percent purity from natural gas or propane. Two basic steps are involved: cracking of hydrocarbons to produce acetylene in a mixture of gases, and recovery and purification of the dilute product contained in the cracked mixture. Feed hydrocarbon is cracked in regenerative type furnaces heated by air-combustion of off-gas from the recovery section. No oxygen plant is required. The recovery and purification section is of conventional design operating at moderate temperatures and pressures. Only a single inexpensive readily-available solvent need be used. Operation is continuous and virtually automatic, requiring a minimum of operating personnel. Power demands are moderate, maintenance costs are low, hazards are negligible and there is practically no waste disposal problem.

The Wulff Process is available through Fluor, a name famous in process design, engineering and construction for the petroleum and chemical industries. For information on recent developments in this field, write for Bulletin EC-PA-0.002.

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When inquiring check CP 1771 on handy form, pgs. 2-3

GREATEST → PERMANENT → MAGNET → NEWS → IN → YEARS

it's NEW! IT'S NEWS!

THE ERIEZ PERMANENT NON-ELECTRIC

HOPPER MAGNET

AFFORDS *New* VITAL PROTECTION

For Food • Milling • Chemical Lines

• ERIEZ HOPPER MAGNET . . . for the complete removal of ferrous contamination from grains, pelleted products, chemicals and other free-flowing materials . . . installed where other magnetic assemblies, because of physical or dimensional limitations, cannot be adapted to steeply sloping hoppers.

ERIEZ HOPPER MAGNET . . . the simplest of all magnetic installations . . . merely lay it in the throat of any wood or steel hopper . . . the magnet will pull and hold all tramp iron passing with the material flow!

ERIEZ HOPPER MAGNET consists of a series of steel step-discs spaced with cylindrical shaped, powerful Alnico V magnets. All parts are permanently attached to a non-magnetic tie rod. Constructed in one-inch increments, the Hopper Magnet can be built to any length desired!

Check These ERIEZ Features:

1. Installation is simple . . . merely lower into hopper so that steel discs rest on hopper's sides.
2. No maintenance required other than periodic cleaning of collected tramp iron . . . just pull the unit out and clean with a cloth.
3. Hopper Magnet's core is a series of Alnico V castings, most powerful, economical magnetic element known.
4. Steel-stepped discs provide efficient distribution of magnet field.
5. First cost is last cost . . . no electricity, no wires needed!

and a Companion

NEW • • RUGGED • • PERMANENT

GRATE MAGNET

THAT BRINGS YOU "TRAMP IRON PROTECTION" NEVER BEFORE POSSIBLE!

• The rugged ERIEZ Grate Magnet removes tramp iron from free flowing materials when installed in hoppers, floor openings, vertical closed chutes, etc.

ERIEZ Grate Magnets are available in 162 sizes, from 2½" x 4" to 36½" x 36" Here's protection to valuable equipment and a great help in preventing product contamination. Stops fires and explosions . . . *tramp iron can't get by!*

Send for free bulletin B-204 fully describing these two new magnetic products

ERIEZ MANUFACTURING COMPANY

13 MAGNET DRIVE • ERIE, PENNSYLVANIA

When inquiring check CP 1772 on handy form, pgs. 2-3

IDEAS

Guards against pressure build-up in pipe-line gate valves . . .

relief features recommended especially in oil lines

Increase in pressure to dangerous levels is prevented by relief feature of pipe-line gate valves. Spring-loaded relief valve on bonnet assembly provides an automatic safeguard against possibility of pressure build-up.

For this reason, this type of valve is recommended by manufacturer where it is to be installed in lines carrying liquids (particularly oil).

Expansion of grease in the lubricating chamber of unit due to increase in atmospheric temperature does not result in a dangerous condition. Design of gate valves also minimizes danger of entrapping liquid in valve bonnet.

How quickly pressures can increase with slight changes in temperature is indicated by test conducted by manufacturer. In one typical test, temperature of fuel oil of 33° API was raised from 76 to 95°F in a closed vessel. This rise in temperature of only 19°F caused an increase in pressure of 1425 lb, an average of 75 lb per °F.

(Class 600 pipe-line gate valves with relief feature are product of Crane Co., Dept. CP, 836 S. Michigan Ave., Chicago 5, Ill. . . . or for more information check CP 1773 on handy Reader Service slip, pages two and three.)

Offer choice of ways to atomize feed of spray dryer

According to a recent announcement, Bowen spray dryers can now be equipped with a choice of nozzle atomization or the previously standard centrifugal atomization.

In addition, it is possible to interchange the two types in the same spray dryer, thus permitting greater flexibility of operation and reducing capital investment where it is necessary to dry a wide variety of materials.

The Bowen laboratory, which has full-scale equipment, is available to make tests on samples with both types of atomization.

(Bowen Engineering, Incorporated, Department CP, North Branch 20, New Jersey.)

PICCO SOLVENTS

and

SOLVENT OILS

Complete Line • High Quality • Uniform

PICCO Coal Tar Aromatic Solvents are available in a complete series of grades, from low to high boiling points, each grade being carefully fractionated to closely maintain specifications.

Complete data on all grades, and samples for testing, will be sent upon request. Please specify application.

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP.

CLAIRTON, PENNSYLVANIA

Plants at Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

When inquiring check CP 1774 on handy form, pgs. 2-3

for all threads, flanges and fittings subject to high temperature . . .

LEADING CHEMICAL PLANTS now standardize on

C-5 "HI-TEMP" THREAD COMPOUND

√ speeds up dis-assembly time!
√ prevents stud breakage!
√ eliminates pitting of stainless steel!

Many leading chemical plants have proved through exhaustive field and laboratory tests that coating all threaded assemblies with Fel-Pro C-5 "Hi-Temp" will greatly reduce operational and maintenance costs.

NO MORE FROZEN OR GALLED STUDS EVEN AT 1800° F

Fel-Pro's exclusive Colloidal-Copper formula allows for easy separation and reduces stud breakage of threaded assemblies after long exposure to extreme temperatures. It eliminates galvanic pitting of stainless and alloy steel even where dissimilar metals are joined.

Conduct your own tests with C-5 "Hi-Temp" at our expense. See how it can lick your toughest thread breakage problems . . . Write for FREE Sample and complete data sheet TODAY!

FELT PRODUCTS MFG. CO.

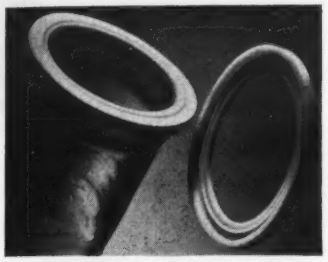
1515 Carroll Ave., Chicago 7, Illinois 6163 CP

When inquiring check CP 1775 on handy form, pgs. 2-3

Dore'

the mark of quality on molded "TEFLON SEALS" for GLASS PIPE

Technical skill and unrivaled production facilities, combined with care and precision, plus specially developed and exclusive operations, are your assurance that "TEFLON" products molded by Dore' meet the most exacting requirements.



"TEFLON" DOG LEGS
Style E-11

Because of their precision fit, these gaskets seal with minimum bolt pressure. They are uniformly sintered and each section of the dog leg has the same density. The protruding sealing faces are not wavy so that they remain in their respective planes throughout the entire gasket's circumference.

"TEFLON" ENVELOPES
Style E-16

Non-Porous "TEFLON" Envelopes, cushioned with a resilient gasket, assures a complete seal for glass flanges in any service. Due to a special process developed by Dore', the "TEFLON" Envelope will not split or break on the inside diameter. Neoprene, compressed asbestos and woven asbestos are generally used as fillers.

DO BUSINESS WITH DORE' for "TEFLON" SHEETS, RODS, TUBES, PACKING SETS, GASKETS, SPECIAL MOLDED SHAPES AND TAPES.

"TEFLON" Shapes at their best — when molded by Dore'.

John L. Dore', Co.

SALES AGENTS IN U.S.A. FOR JOHN L. DORE, INC.
MOLDERS OF "TEFLON" AND "KEL-F" SHAPES
P. O. BOX 6002 • HOUSTON 6, TEXAS

When inquiring check CP 1776 on handy form, pgs. 2-3

Electrolytic process making 99.8% pure alumina from low-grade clay . . .

operating-cost estimates indicate it has edge over bauxite-using Bayer process

A continuous electrolytic process for producing high-purity alumina from low-grade domestic ores is ready to be licensed, after being proved with a year's operation in a pilot plant in Europe. The process, which is continuous and recovers 99 to 100% of all reagents used, has been operating purposely with low-grade kaolin clay (10% alumina and 80% silica) to prove that there is little or no limitation on the amount of impurities which it can handle. Preliminary cost estimations indicate that 99.8% pure alumina can be produced at a lower cost than from bauxite via the Bayer process (see table).

The Lobeth process costs presented in the table are based on estimates arrived at from the pilot plant work, and are converted to US dollars. A clay of

Cost of Producing Ton of Alumina —Lobeth vs. Bayer

Materials & Operations	Lobeth	Bayer
Sintering & Clay	$3.30	—
Bauxite	—	$11.50
Reactives	1.60	—
Soda Ash	—	10.46
Limestone	—	.83
Filter Cloths	.80	.42
Starch	—	.50
Electrical Energy*	13.50	—
Steam	.80	—
Labor and Salaries	3.10	3.10
Repairs & Maintenance	1.70	1.70
Direct Expense Costs	—	2.40
Red Mud Process	—	4.80
Calcining Alumina	1.50	1.50
	$24.16	$37.21

*1.6 Less than two used per pound of alumina. Rate used 5 mils.

10% alumina and 60% silica is the basis for Lobeth, while a bauxite of 50% alumina is the basis for the Bayer process cost estimate.

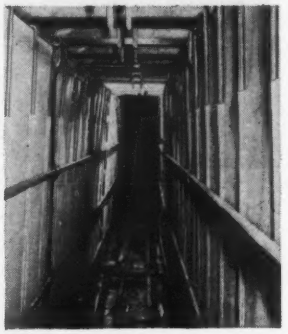
(Process is licensed through Lobeth Corporation, Dept. CP, 624 S. Michigan Ave., Chicago, Ill. . . . check CP 1777 on handy form, pages 2 and 3.)

Permeable dielectric shows high attenuation

Concise, profusely illustrated bulletin deals with maker's Polyiron — a material readily molded or machined into any shape. At microwave frequencies, the material is used as a permeable dielectric, providing higher attenuation than that of other commonly available dielectrics, according to report. It is possible to attain attenuation up to 300 DB per inch with lower standing-wave ratios.

"Microwave Components" also deals with various kinds of terminations, stock blank sizes, machining procedures, and drawings of typical frabrications. Issued by Henry L. Crowley & Company, Inc., 1 Central Ave., West Orange, N. J. When inquiring specify CP 1778, pgs. 2 & 3.

Typical Wet and Dry Filtrations **prove** Dynel Fabrics cost less to use...



WET FILTRATION — Dynel diaphragms in copper plating tank (shown in automotive plant) have use-life of 4-6 months, compared to 7-13 weeks of previous filter cloths.

DRY FILTRATION — Dynel-wool dust fume bags outlast all-wool bags 9 to 1 in antimony smelter. In addition, their original cost is less than that of other bags.

During a 60-day actual-use test, Dynel filter cloths required only about ⅛ as many replacements as comparable cotton filter cloths under similar conditions. This reduced cloth costs by 75.4%. Fabrics were tested on a 36-inch Shriver plate-and-frame press, used for filtering various ore slurries. Total usage was 93 cotton cloths, 11 Dynel. Of the 93 cottons, most rotted because of acid disintegration. No such failures resulted during use of Dynel. Also, Dynel cloths did not become stiff with use, nor did the filter cakes adhere as tightly to them as to the cotton cloths.

Supervised Test proves Dynel Filter Cloths last 8 times longer, cost 75% less than cotton...

...Only Dynel Filter Fabrics give you all these advantages:

- ***Unaffected by most chemicals***
- ***Won't shrink or stretch***
- ***High strength—wet or dry***
- ***Mildewproof—fungus-proof***

20-hour Immersion Tests demonstrate Dynel's chemical resistance

Tests made on 57 different chemicals, including acids, bases, oxidizing agents and solvents — after 20-hr. immersion periods are summarized in a handy leaflet. Write for your copy.

Investigate Dynel today! For a list of manufacturers so you can test Dynel filter cloth under the specific conditions in your plant, please write us on your company letterhead. Address:

Textile Fibers Dept. P-1, Carbide and Carbon Chemicals Company
A Division of Union Carbide and Carbon Corp., 30 E. 42nd Street, New York 17, N. Y.

Performance will tell...it's DYNEL!

When inquiring check CP 1779 on handy form, pgs. 2-3

NBS tells success of impregnating leather with polyisobutylene

The process for impregnation of leather with natural rubber, announced by NBS in 1949, has recently been extended to permit the use of polyisobutylene as an impregnant. Although leathers impregnated with natural rubber and with polyisobutylene have equal abrasion and water resistance, the latter has the distinct advantage over rubber in that it eliminates the milling operation required to reduce the molecular size of natural rubber sufficiently to allow deep penetration.

Impregnation with the butyl compound merely requires soaking of the naturally porous leather in a solution of that polymer. The impregnating solution is prepared by dissolving polyisobutylene in common solvents such as gasoline, kerosene, benzene, or chloroform. The leather is air-dried and immersed in the solution for about 3 hours. It is then removed from the solution, the excess solvent wiped off, and the remaining solvent is evaporated from the leather.

If vegetable-tanned crust leather is used and the grain or hair side of the leather is split off to a depth of about 40 mils before impregnation, penetration by the polyisobutylene is more rapid and uniform, thereby affording tangible economies in the process.

Investigations by the National Bureau of Standards indicate that the butyl polymer is well suited for treating shoe soles and upper leather, luggage, upholstery, book bindings, etc.

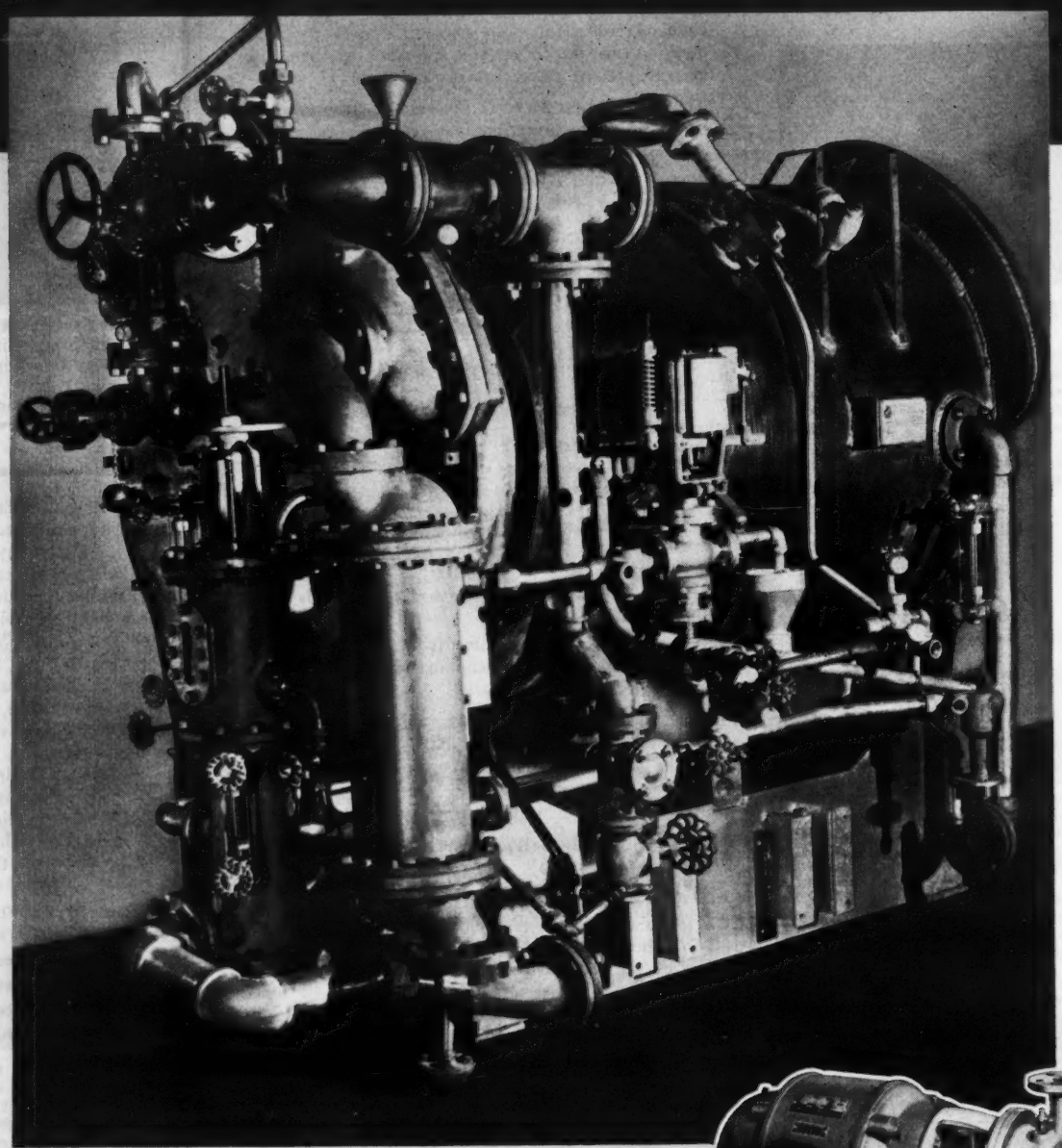
(Butyl-impregnation process was developed by Rene Oehler, Sverre Dahl, and T. J. Kilduff of the leather laboratory of National Bureau of Standards, U. S. Department of Commerce, Washington 25, District of Columbia.)

Better spray performance reported for aerosol dispensing valve . . .

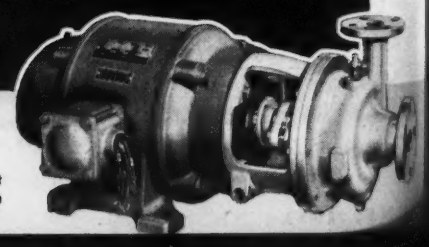
permitted by design of seat and diaphragm

Design of aersol dispensing valve is said to provide improved spray performance, making possible the packaging of new pressurized products. Included in features are a

Your CORROSION PROBLEMS evaporate wi



Salt water evaporator manufactured by Griscom-Russell Co., Massillon, Ohio. Ampco Metal is the principal component of construction.



Ampco Centrifugal Pumps resist corrosion, abrasion, cavitation erosion.

Russe
Metal
A
even
corros
applic
T
tough
Ampc
evapo
reduc
T
has hi
atures
@ 70
streng
resista
Code
C
save
erosio
Y
sheets
with
today

Fabricating Ampco Metal with inert-gas consumable-electrode welding.

with AMPCO* METAL

on your tough jobs!

Hot salt water is a corrosion headache in any man's language. And that's why sea-water evaporators manufactured by Griscom-Russell Co. of Massillon, Ohio are made principally of Grade 8 Ampco Metal.

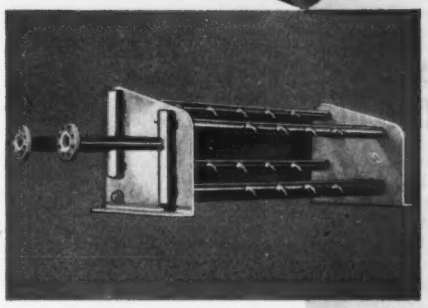
Ampco Metal has exceptional resistance to corrosion from sea water — even brackish water and polluted harbor-water, as well as many other corrosive liquids. That's why it's so widely used in chemical and process applications, as well as in marine service.

That's not the only reason Grade 8 Ampco Metal was selected for this tough service: It adapts to complicated shapes — it's easy to fabricate with Ampco-Trode* welding wire or coated electrodes. Weight is saved — this evaporator is 10% lighter than previous units, with even further weight reductions possible.

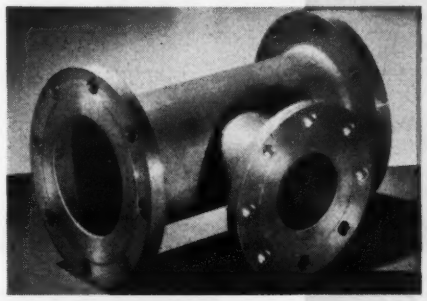
This remarkable aluminum bronze alloy not only resists corrosion, but has high tensile strength (75,000 psi) . . . high physicals at extreme temperatures . . . high impact and fatigue values (Charpy @ −423° F, 93 ft.-lb.; @ 70° F, 75 ft.-lb.; fatigue limit 28,000 psi @ 100 million cycles) . . . high strength to weight ratio . . . and high compressive strength. It has unusual resistance to wear, abrasion, pitting, and cavitation erosion. It has Boiler Code approval for unfired pressure vessels.

Complete the story yourself! Find out how Ampco Metal can help you save production time, trouble, and money — how it gives you corrosion-, erosion-, abrasion-proof service in hundreds of applications.

You can get Grade 8 Ampco Metal in practically any form you require: sheets, plates, extrusions, castings, pipe, fasteners, etc. Check with your nearest Ampco field engineer or send the coupon today for more information.



Sulfuric acid spray unit.



T fitting — sand-cast.

Hasco valves — made entirely of Ampco Metal.

Tear out this coupon and mail today!

*Reg. U. S. Pat. Off.

Ampco Metal, Inc.

MILWAUKEE 46, WISCONSIN

West Coast Plant: BURBANK, CALIFORNIA

AMPCO METAL, INC.
Dept. CP-6, Milwaukee 46, Wisconsin

Send me information on the application of Ampco aluminum bronzes for corrosion-resistant service in the process industries.

Name..... Title.....

Company.....

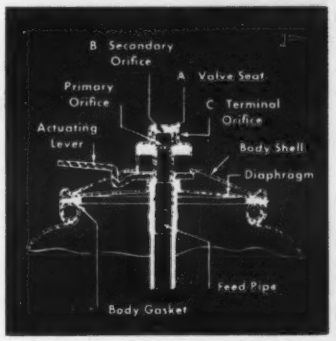
Company Address.....

City.....(.....) State.....

PR-12

flexible metal diaphragm and a valve seat, made of nylon or Teflon. This enables all standard propellents to be used as well as high solvency materials Freon-21, Freon-22, and methylene chloride.

Valve produces a soft spray-cloud of minute and uniform particles. When required, a slightly modified



Cutaway drawing of aerosol dispensing valve illustrates features

model can be supplied to give a heavy, wet spray. Proximity of the secondary orifice to the terminal orifice minimizes possibility of clogging due to internal drying.

Quick, positive cut-off minimizes wasteful nozzle drip. Position of the actuating lever makes spray direction immediately obvious, preventing accidental misdirection of spray. Only portion of valve seat exposed to can contents during storage is tiny pinpoint of secondary orifice.

(Operating samples of valve on a loaded dispenser are available on letterhead request to Valve Div., The Risdon Mfg. Co., Dept. CP, Naugatuck, Conn.)

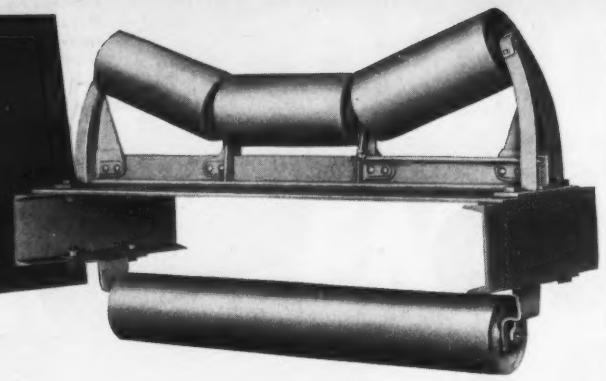
A company name and address . . .

at end of each editorial article makes it easy to follow-up on ideas you read about in these columns . . . saves you time. Write direct or use the handy Reader Service slip.

THE EDITORS

For more information on product at left, specify CP 1780 . . . see information request blank between pages 2 - 3.

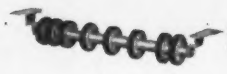
LINK-BELT IDLERS



. . . the long-life answer to higher belt conveyor efficiency

WHEN your materials move on Link-Belt roller bearing idlers, you're assured of free-rolling efficiency. And because friction loss is minimized, they require less power to operate. You'll like their low maintenance, too. Grease-in-dirt-out seals preserve lubricant. Dozens of other design features promote long life.

Choose from a full line of 20° and 45° troughing idlers in a variety of styles. Belt-training and flat belt idlers are also furnished in a wide range of roll diameters and belt widths. See your nearby Link-Belt sales representative or distributor for new Book 2416.



Series "100" rubber tread return idler.

Series "100" troughed belt-training idler, positive action type.

LINK-BELT

ROLLER BEARING IDLERS

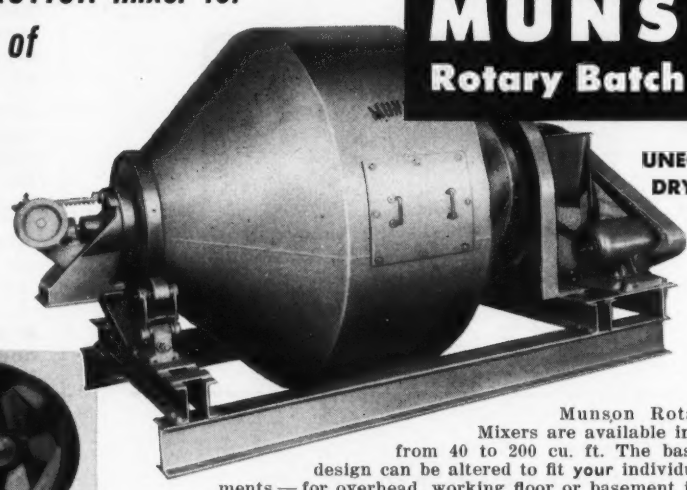
LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities. 13.219-A

When inquiring check CP 1781 on handy form, pgs. 2-3

MIX IT better . . . MIX IT faster . . . MIX IT with a

. . . the TUMBLING ACTION mixer for intimate blending of dry ingredients

MUNSON
Rotary Batch Mixer



For intimate, accurate mixing of dry ingredients in the **shortest** time — the Munson Rotary Batch Mixer has proved its value on **hundreds** of different applications. Will not stratify ingredients — will not alter characteristics of basic components. Its famous 7-way mixing action, plus lower horsepower requirements and low operating costs, make the MUNSON **first choice** for performance **and** economy!

UNEQUALLED FOR DRY MIXING OF:

Chemicals,
Fertilizers, Feeds,
Cereals, Gelatin,
Glue,
Soap Compounds,
etc.

NO OTHER MIXER HAS THIS MULTIPLE-BLENDING ACTION!

Lifters on inside of truncated cone ends continuously cut out and lift ingredients as drum slowly revolves. Rotating cone tumbles stock toward center. Conveyor flights on mixer shaft also stir and agitate stock back to center of drum — where mixing cycle repeats.

Munson Rotary Batch Mixers are available in capacities from 40 to 200 cu. ft. The basic Munson design can be altered to fit your individual requirements — for overhead, working floor or basement installation.

Munson engineers — skilled in processing procedures — will be glad to assist in solving your mixing problem. For full information, write us today . . .

Other famous MUNSON products: Rotary Knife Cutters, Hammer Mills (25 to 100 HP), Attrition Mills (24" to 30"), Rotary Crushers . . .

MUNSON MILL MACHINERY CO. Dept. P-653 Utica, New York

When inquiring check CP 1782 on handy form, pgs.2-3

Caustic chloride regeneration of anion exchange resin ups capacity 45% . . .

higher pH of dealkalized effluent cuts corrosion of cast iron pipe; alkalinity leakage is less

Caustic chloride regeneration of strongly basic anion exchange resins increases the exchange capacity of the resin and decreases the alkalinity leakage, when compared with straight brine regeneration. In addition, pH of dealkalized effluent is raised to approximately 9.5, the optimum level for inhibiting corrosion in cast iron pipe. With this technique, a small, controlled amount of sodium hydroxide is added to the standard brine solution normally used for regeneration.

A dealkalization system employing the technique was put into operation at Martin-Century Farms, Lansdale, Pa., in February, 1952. Consisting of a pair of 24" units, each containing 6.3 cu ft of Amberlite IRA-410 resin, the system provides boiler feed water having reduced alkalinity and complete freedom from dissolved carbon dioxide.

The following table shows the analysis of the water as received by the dealkalizer. It has previously been passed through a cation exchange softener, as is evidenced by the low calcium and magnesium content and high sodium content.

	Dealkalizer Influent (ppm as $CaCO_3$)		
Ca	0.5	SO_4	45.0
Mg	0.5	Cl	15.0
Na	209.0	HCO_3	150.0
	pH 8.0		

Experience in this installation shows that, with a 24" bed, the addition of 0.4 lb sodium hydroxide per cu ft resin to the brine regenerant keeps the pH level up around 9.5 for about the first 5000 gal of water processed. When regenerated with brine alone, the pH falls below neutral after the first 1500 gal or so of water have been processed.

Second advantage is clearly shown on Figure 1. Here, it can be seen that the exchange capacity is increased by 45% or more by the alkali-plus-brine regenerant, depending on initial ratio of alkalinity to total anion concentration in the influent.

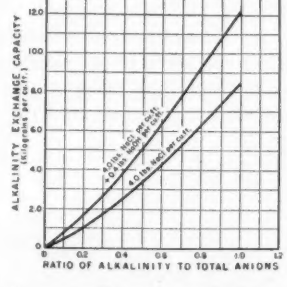

ALKALINITY EXCHANGE CAPACITY (KILOGRAINS PER FT³)
RATIO OF ALKALINITY TO TOTAL ANIONS
0.4 lbs NaOH per cu ft resin
0.0 lbs NaOH per cu ft resin

Figure 1—Comparison of alkalinity exchange capacities of the resin bed shows an approximately 45% increase in capacity with alkali-plus-brine regenerant

This higher capacity is apparently the result of two factors. One is the neutralization effect of the hydroxide on the dissolved carbon dioxide, existing primarily as carbonic acid. This effect increases the solubility of the carbon dioxide in water, and thereby reduces blanketing of the exchanger with the gas. Such blanketing is thought to reduce the effec-

tive exchange capacity of the resin and interfere with efficient regeneration.

The second cause of the higher exchange capacity is that the divalent carbonate/chloride system is more favorable than the monovalent bicarbonate/chloride cycle.

Figure 2 illustrates the improvement in leakage performance of the caustic chloride regeneration system. Dealkalization with strongly basic anion exchange resins has, in general several working advantages over the usual acid type dealkalization system. First, it eliminates the possibility of introducing acid water into boiler and water lines. Second, expensive acid resistant equipment and special acid-handling instructions are not needed. Third, no degasification equipment is required.

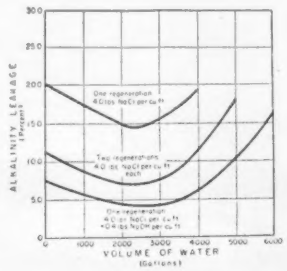


Figure 2—Alkali-plus-brine regeneration shows reduced alkalinity leakage. Leakage is recorded and plotted as total methyl orange alkalinity. Actually, pH of water entering system is about 8, while that leaving is about 10. This means that the potential CO_2 leakage in the effluent as compared to the potential CO_2 contained in the bicarbonate alkalinity influent is only about half as much per unit of alkalinity

(Caustic chloride method of regeneration is a development of American Water Softener Company, Inc., Dept. CP, Fourth & Lehigh Ave., Philadelphia 33, Pennsylvania. Amberlite resins are made by Rohm & Haas Company, Department CP, Washington Square, Philadelphia 5, Pennsylvania.

Issue booklet on safe use of additives in foods

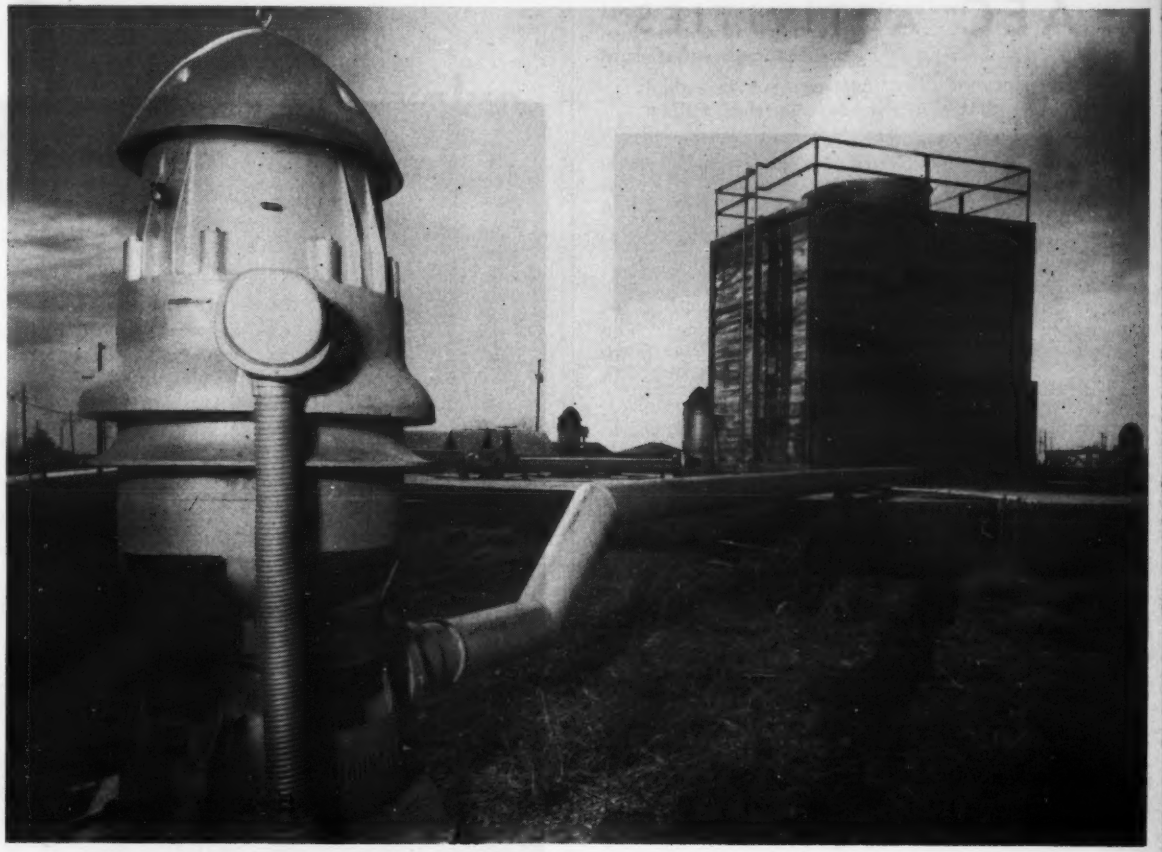
"Safe Use of Chemical Additives in Foods" is title of a 28 page booklet issued by the National Research Council. Book was prepared by the Food Protection Committee of the Food and Nutrition Board, whose objective was to develop guiding principles and standardized procedures essential to safeguard food.

Three statements are treated: 1. Basic principles in the use of chemical additives in foods; 2. Basic considerations in use of pesticides on foods; and 3. Basic considerations in the development of new agricultural pesticides intended for use in connection with food production.

The first two titles were previously published in mimeograph form. The third is published for the first time. This statement includes proposed evaluation procedures, including chemical, physical, biological, and toxicological data, and suggestions for coordinating these results.

Booklet may be obtained by simply writing to the Food and Nutrition Board, National Research Council, National Academy of Sciences, Washington 25, District of Columbia.

Critical Jobs Are Routine For Johnston Pumps!

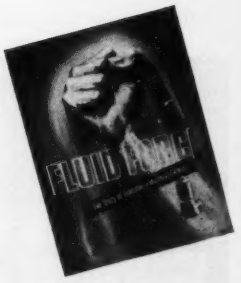


PUMPING HOT LIQUIDS, FOR EXAMPLE...

There are four Johnston Vertical Turbine Pumps in the illustration. One is a 200 H.P. unit delivering 1000 G.P.M. of 130 degree water from a well against a 450 foot head. There is also a 7½ H.P. unit that recirculates the water from the reservoir to the cooling tower. The other two units are close-coupled booster pumps delivering cooled water from the reservoir into the system.

These pumps are ALL Johnston STANDARD CONSTRUCTION. When you select Johnston, you don't have to buy a lot of extras just because your job is a tough one.

This is another example of the ability of Johnston equipment to handle all kinds of pumping jobs. For the kind of pump "know-how" that puts money in the bank, see your Johnston Dealer or ask a factory representative to call. They're always glad to help.



Send today for your free copy of "Fluid Force". Ask for bulletin D-63.

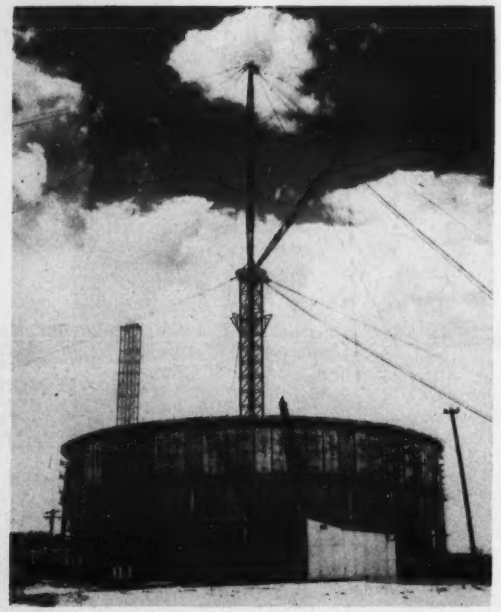
JOHNSTON VERTICAL PUMPS

JOHNSTON PUMP COMPANY

3272 EAST FOOTHILL BLVD., PASADENA 19, CALIFORNIA

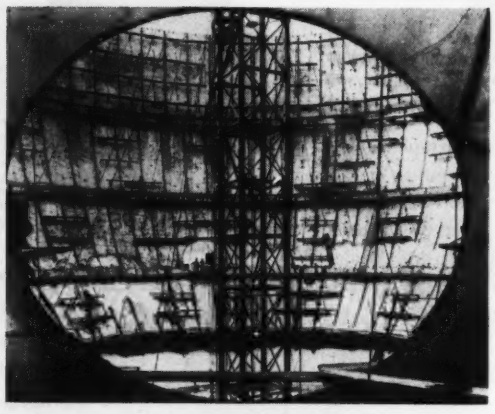
When inquiring check CP 1783 on handy form, pgs. 2-3

AEC ACTIVITIES

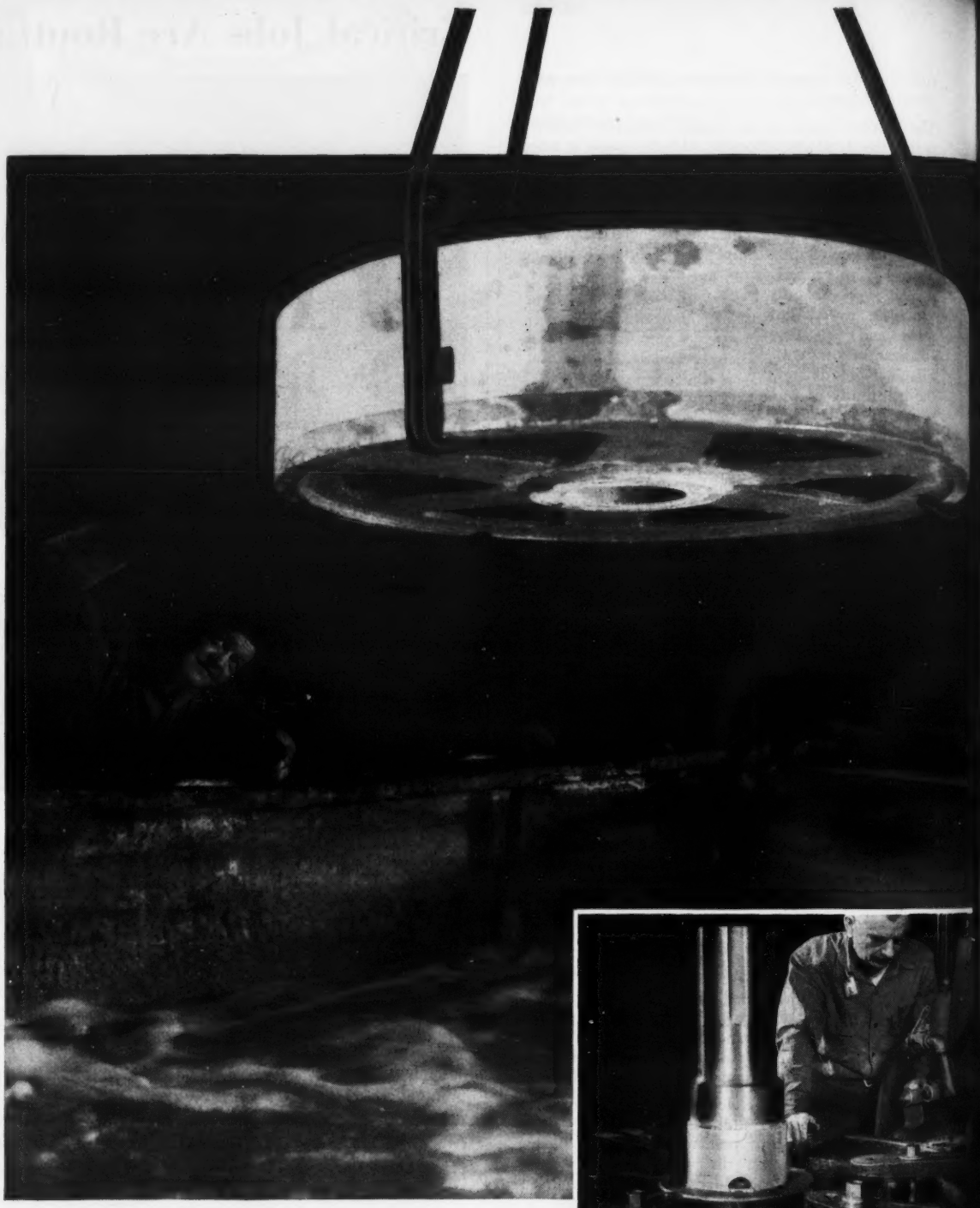


ATOMIC POWER HOUSE — Gigantic steel sphere which will house an atomic power plant for submarines. Power plant is being built by scientists of the Knolls Atomic Power Laboratory, operated by the General Electric Company for the AEC

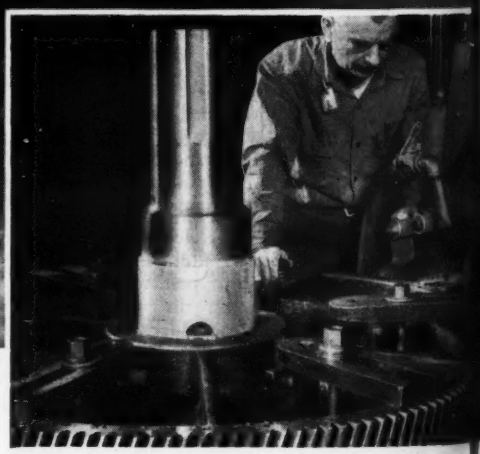
Structure, going up on a site at West Milton, N.Y., about 18 miles from Schenectady, now resembles a huge bowl but will take sphere shape as upper half becomes completed



ATOMIC EYE VIEW — Large opening, resembling an eye, permits inside glimpse of steel sphere. The circular hole is for air-tight entrance lock. Opening for another lock is seen on opposite wall of sphere. Rising in middle of sphere is base of 400' tower, used for erecting huge 1"-thick steel plates which comprise sphere



After heating, all Westinghouse Gear Blanks receive this quenching in an exclusive BPT solution. Gears so processed have a tapered hardness from surface to core—absorb the shocks of everyday service.



The hobbing process, long recognized as one of the most accurate of gear-cutting methods, is used on gears for all Westinghouse Speed Reducers. It assures true gear meshing and quiet operation of the finished speed reducers.

Do your speed reducers have the added value this precise manufacturing assures?

Are you getting toughness, stamina, long life? These are qualities of Westinghouse Speed Reducers which stem from the step-by-step precision that goes into their making.

Westinghouse Gear Blanks, for instance, are made from high-quality steel that's thoroughly checked for conformity to specifications. Gears are hob cut which means precision cut. They're heat-treated by an exclusive Westinghouse BPT process that carefully tapers gear hardness from surface to core. It's your assurance of gear teeth that will resist surface wear yet absorb the many shocks of service.

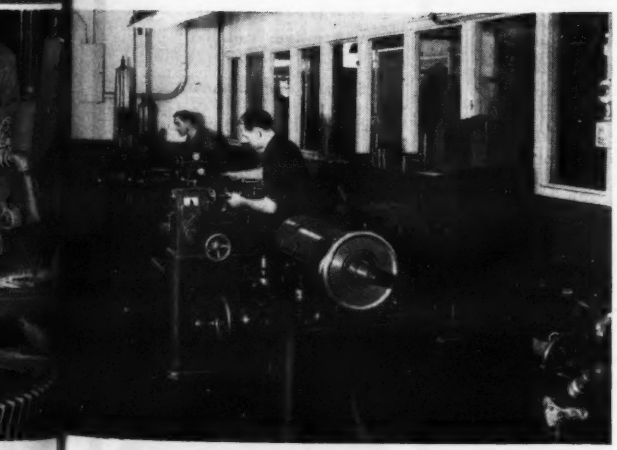
Antifriction bearings on all Westinghouse Speed Reducers lessen friction loads—especially on starting. They maintain precise gear center distance. The result—permanent alignment and minimum friction loss.

The rugged cast iron gear case is made in two sections for ready accessibility of all working parts. Thus servicing is greatly simplified. Ribbing, provided at points of greatest stress, gives extra strength and rigidity with proper alignment of parts maintained at all times.

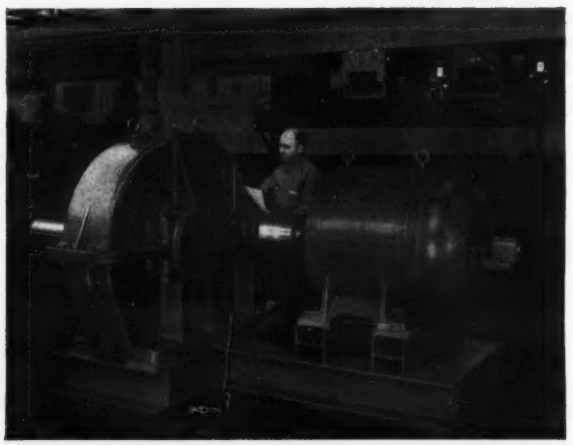
These features, together with many others that are designed, manufactured and tested to meet rigid Westinghouse standards, are the result of over sixty years' experience in the design and manufacture of gearing. This adds up to speed reducers that give year-in, year-out, trouble-free performance. Investigate the full line of Westinghouse Gearing Equipment wherever speed reduction is required. Your local Westinghouse representative will be glad to furnish any information. Call on him at any time or write, Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

J-07332

YOU CAN BE SURE...IF IT'S Westinghouse



All machined parts are thoroughly inspected at each step of manufacture to assure the high degree of accuracy necessary for smooth operation. Hobs and other tools are also checked repeatedly to control uniformity of gears produced.



Before shipment, each complete speed reducer is given a running test under load. These tests enable Westinghouse to determine in advance the performance of each unit under conditions approximating actual service.

When inquiring check CP 1784 on handy form, pgs. 2-3

Liquid metals have advantages as heat-transfer agents for high-temp applications . . .

high heat transfer rates result in cooler tube walls and longer tube life

Liquid metals have singular advantages as heat-transfer agents for certain high-temperature applications. Water, although an excellent heat-transfer fluid and the most widely used for this purpose, has certain disadvantages above 500°F. These include high vapor pressure and a tendency to break down into hydrogen and oxygen. Metals, however, have much higher boiling points and consequently negligible vapor pressure at those temperatures. Furthermore, their very high thermal conductivity yields higher heat-transfer coefficients.

Aside from mercury power plants, no applications of any consequence have yet been made. Possibilities include the use of liquid metals as coupling fluids in power and process applications, such as steam reheating, regenerative heat exchangers for gas turbines, and chemical processes requiring uniform heating and cooling. Liquid metals also appear to be particularly suitable as coolants for high-temperature nuclear reactors.

From a practical standpoint, liquid metals offer the following advantages:

1) A high boiling point means less likelihood of localized boiling and overheating; lower fluid pressure produces lower stresses in tube walls.

2) High heat-transfer rates result in cooler tube walls, longer tube life, and more uniform cooling and heating.

3) Thermal and chemical stability permits the use of higher operating temperatures.

4) Liquid metals do not decompose when subjected to nuclear radiation, although they would become radioactive in passing through a reactor.

Liquid metals have a disadvantage in their relatively low heat-storage capacity. A larger quantity of liquid metal than of water is needed to remove a given quantity of heat. But this is not a serious limitation to their use.

(From report KAPL-P-692 by T. Trocki and issued by Knolls Atomic Power Laboratory, Operated for U.S. Atomic Energy Commission by General Electric Co., Schenectady, N. Y.)

What a nuclear fuel must have to qualify for use in producing power . . .

must be serviceable at high temp and of such nature that heat can be removed readily

The design and operation of nuclear reactors for producing power is intimately associated with the development of suitable nuclear fuel. Latter must meet strict physical and chemical, as well as nuclear, requirements in order to support a chain reaction in a reactor at relatively high temperature and energy levels. The following reviews some

(*Continued on next page*)

Amazing New Surge Classifier with Synchronized De-Tensing!

...made possible with TEFLON*

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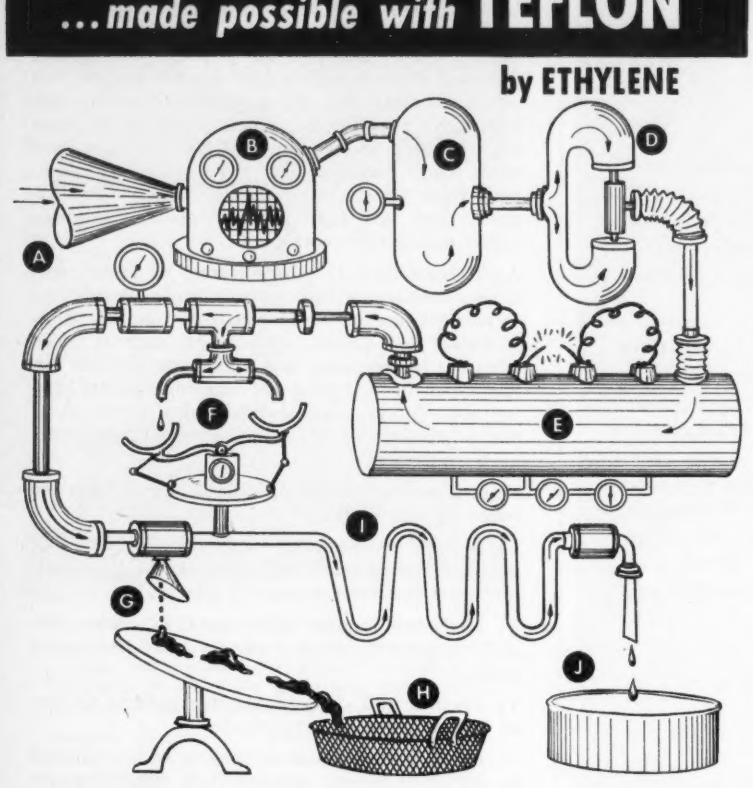

Alternately very hot and very cold ionized gases enter TEFLON tube A [1], Magnetic pulse de-energizer B liquefies heavy elements and ejects extremely corrosive gas stream into acid chamber made of TEFLON C [2]. After scrubbing in counterphase retort D, product is degaussed in 30,000,000 megacycle field E [3] and flip-flop counter F records number of abstaining groups. Unpledged macro-elements hit TEFLON baffle plate G [4] and *slip* off into basket H. Remaining particles, being committed, pass through vibratory flexible TEFLON hose I [5] into can J.

[1]TEFLON used here for its wide thermal range, —100°F. to 550°F.

[2]TEFLON is the only material sufficiently inert for acid chamber construction.

[3]TEFLON used in degausser because of its remarkable dielectric strength and constant—and extremely low loss factor.

[4]TEFLON'S non adhesive character ideal for baffle.

[5]TEFLON'S excellent flexural strength disqualified all other material.

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When inquiring check CP 1785 on handy form, pgs. 2-3

(*Continued from preceding page*)

of the requirements of nuclear fuels as well as their reprocessing.

Nuclear Fuels. By nuclear fuel is meant some fissionable material capable of supporting a chain reaction. Term is applied not only to pure U-235, Pu-239 or U-233, but also to their chemical compounds, alloys or mixtures with other elements. The fuel may be used for explosion in a bomb, production of radioisotopes, manufacture of secondary fuel, or generation of useful power. Here, the term will refer to fissionable material in such chemical and physical form that it will support a controlled chain reaction in the proper environment at relatively high temperature and energy levels.

Power Production. As far is known today, the only practical way of converting fission energy into electricity is through the intermediate steps of heat and mechanical energy, and the use of a turbine-generator. Thus, the fission chain reaction becomes merely another way of getting heat, and in that case the nuclear reactor is simply a substitute for the firebox and boiler of a conventional power plant.

The reactor may be characterized as a very special assembly of (1) nuclear fuel, (2) moderating material to control the energy of the neutrons given off, (3) heat-transfer media to remove the heat, (4) shielding to confine the intense radiation, and (5) means to control the rate of fission.

Critical Mass. A fission chain reaction requires a critical mass of fissionable material and a critical size of reactor. Required critical mass may vary from a few pounds of pure U-235 to several tons of natural uranium. It depends not only on the type of fuel but also on the amount of moderating material, the amount of absorbing material, the presence or absence of a neutron reflector around the reactor — and their physical arrangement.

The critical mass of a reactor cannot be exceeded without loss of control of the reaction. However, in a reactor intended for large power output, the need for structural and heat-transfer materials, undesirable from a strictly nuclear standpoint, influences the nuclear factors in the direction of larger critical mass and size. To a certain extent this is fortunate, because even with the increased size, heat must be removed from a limited volume and concentrated thermal fluxes must be dealt with which greatly exceed those found in ordinary heat-transfer processes.

It becomes evident, therefore, that in order to be useful for power production, nuclear fuel must be capable of operating at high temperature. Furthermore, it must be of such a nature and so arranged that heat can be readily removed by a heat-transfer medium.

Both of these factors have a great influence on the nature of the fuel, the way it is contained, and the way it is distributed through the reactor. Solid uranium metal conducts heat relatively well, but it has other limitations, including too low a melting point (1133°C) for some applications. Oxides, alloys, mixtures, liquids and gases have all been

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considered as potential power-reactor fuel material, and in many different arrangements.

Burnup. Depletion of fuel due to fission is referred to as burnup. As it occurs, the fission chain reaction stops — unless compensating steps are taken or the burned and contaminated fuel is replaced. One such compensating step is to put a neutron-absorbing material such as boron into the reactor, and then to remove it gradually to compensate for the fuel depletion. A complication is the fact that certain of the fission products formed during burnup are good neutron absorbers, and these also interfere with the chain reaction and require compensation.

Fuel Replacement. As fuel is burned up, new fuel must be added to maintain the fission chain reaction. In addition, because of fission-product poisoning, fuel may have to be removed long before it is completely burned up. After it is removed, it must be reprocessed to reclaim the valuable fissionable material still remaining. The process must be efficient and not too expensive Whether it is feasible depends upon the suitability of the fuel for reprocessing — upon its chemical form, its dilution with other materials, and its container, if any.

Reprocessing Methods. Actual reprocessing methods are many and varied. Strictly physical methods are used when the problem is one of separating two isotopes of the same element; for example, U-235 from U-238. Chemical methods, such as precipitation, ion exchange, solvent extraction and volatilization are basically better adapted to the problem of separating low concentrations of materials, such as plutonium and fission products, from high concentrations of elements, such as uranium and thorium.

The physical form in which the fuel is used may determine to a degree the type of efficiency of the process used. The known fissionable materials may be prepared and used as metallic powders, rods, sheets, etc., or in the form of oxides or salts.

(From report KAPL-P-684 by J. F. Flagg and M. J. Gross and issued by Knolls Atomic Power Laboratory, Operated for U.S. Atomic Energy Commission by General Electric Co., Schenectady, N. Y.)

Pendulum-like action of crane hook is sharply reduced when servo motor takes over . . .

with variable speed hoisting, AEC lab model effectively halts "creeping" of hot loads

An anti-swing crane with anti-creep variable speed hoisting has been developed by the Remote Control Engineering Div. of Argonne National Lab.

In a laboratory model of the crane, pendulum-like swinging of the hook and load has been reduced to a minium while vertical creeping of the load has been eliminated. With this type of crane control, using a servomechanism, radioactive and/or thermally hot materials can be transported without personnel having to guide and steady the hook and load.

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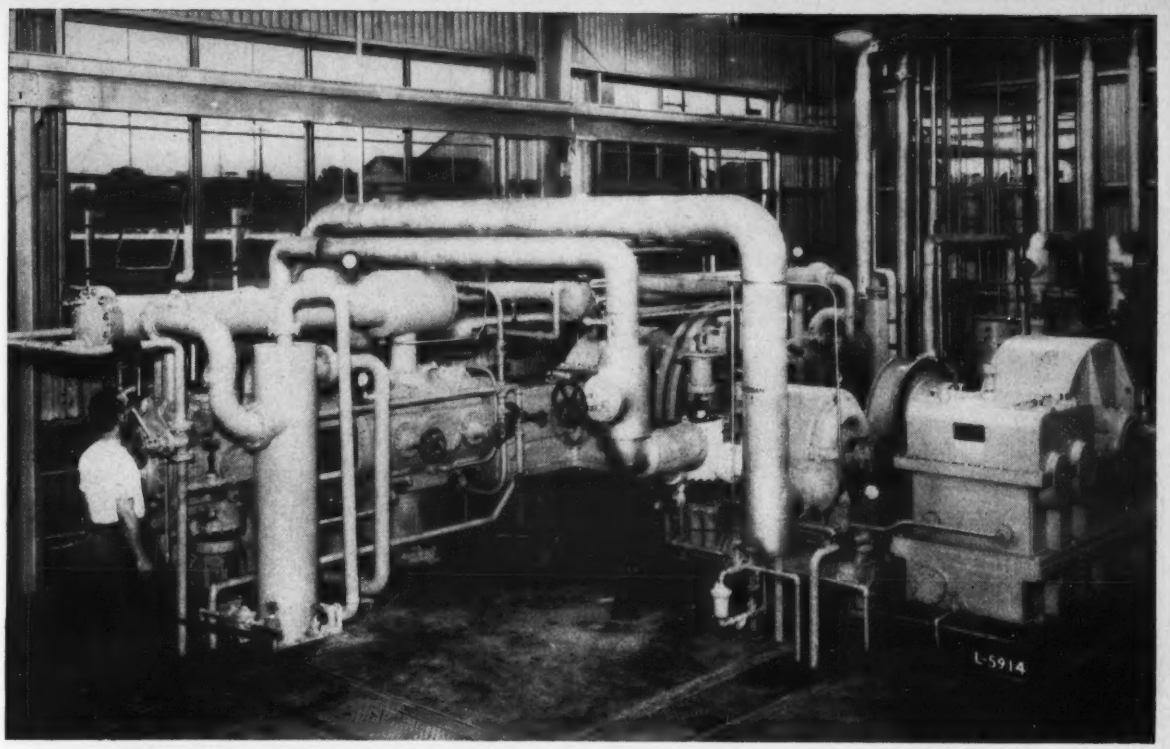


800-HP WORTHINGTON MULTI-STAGE TURBINE drives reciprocating compressor through double reduction gear.

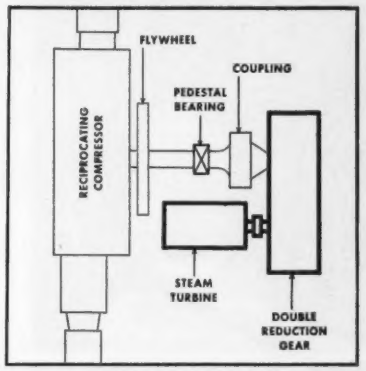
Compact turbine and gear arrangement drives reciprocating compressor at Pure Carbonic

This Worthington installation at the Kansas City, Mo., plant of the Pure Carbonic Company marks a new step in CO_2 plant design practice. A CO_2 reciprocating compressor is driven through a double reduction gear by a multi-stage steam turbine. This unusually compact installation reaches a new high in over-all plant efficiency.

Here are a few of the reasons why the plant engineers, J. F. Pritchard & Company, chose Worthington steam turbine-gear drive over other types of prime movers:

Clean exhaust steam—ideal for processwork
Low operating cost
Turbine speed may be varied to match the load at any time
High overload capacity

Remember, the engineering of the drive is just as important as the engineering of the compressor. Let Worthington engineers work with you on your compressor-drive problem. Write stating details to Worthington Corporation, Steam Turbine Division, Wellsville, N. Y. T.2.20



BLOCK DIAGRAM SHOWS COMPACT ARRANGEMENT of Worthington compressor-drive installation at Pure Carbonic's plant in Kansas City, Mo.

A GREAT TEAM IN STEAM

WORTHINGTON
Steam Turbines

When inquiring check CP 1787 on handy form, pgs. 2-3

OVER 500,000 GALLONS OF WATER are used every day in the Lakeland Company's tannery. This is the de-hairing area, where hides are being treated with a sulphite and lime solution.

Worthington vertical turbine pump cuts power costs at Florida tannery

THIS COMPACT WORTHINGTON TURBINE PUMP runs 24 hours a day, 7 days a week, assuring a constant, reliable water supply for the tannery.

Power costs at the Lakeland Tanning Company in Lakeland, Fla., decreased as soon as a Worthington vertical turbine pump was installed.

Previously, water was supplied by a pump handling 500 gallons per minute, and driven by a 50-hp motor. Every time the pump started up, every other electrical unit in the plant slowed down or dimmed. The smaller Worthington pump furnishes an adequate water supply and uses only a 15-hp motor.

Here's what H. C. Lutes, owner-president of Lakeland, writes about his Worthington:

"We are well pleased with this pump. It has effected a considerable saving in electricity for us since its installation. No maintenance has been necessary, and this, of course, is a most important factor since our plant would be disabled in case of water failure. To any plant operator desiring trouble-free, dependable service, I would not hesitate to recommend the Worthington."

Reports like this are typical of those received from Worthington users everywhere. Find out how Worthington vertical turbine pumps can save *you* money. Get in touch with your nearest Worthington district office or write to Worthington Corporation, Vertical Turbine Pump Division, at Succasunna, New Jersey, or Denver, Colorado.

D.3.3

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Vertical Turbine Pumps

CONSERVE GROUND WATER; IT IS A VALUABLE RESOURCE AND IS NOT UNLIMITED

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(*Continued from preceding page*)

On the model, the normal carriage drive has been replaced with a servomechanism which moves the carriage in accordance with electrical signals to take up the momentum of the swinging hook or load. The crane operator determines the desired direction the crane will travel and turns a control knob on the instrument panel. This sets the crane moving in the desired direction and while doing so, transmits electrical signals to the servomechanism regarding its position, speed of movement, and amount of swing of its load.

The servomechanism adds these positive and negative signals to that which was placed into the servomechanism when the operator turned the control knob. A summation of the signals equalling zero means that the crane has reached its desired position. Deviations from a total of zero cause the crane carriage to move forward or backward.

An electrical signal which indicates the degree of swing of the load causes a slight movement of the crane's carriage in the direction of the swing. This action allows the load to dissipate its oscillatory energy into the carriage and, as a result, the load stops swinging within one or two cycles.

The crane is also equipped with a continuously variable speed drive for hoisting operations. This assures smoother and more accurate vertical control of the load than is possible with conventional cranes. A feed-back arrangement is incorporated into the hoist drive which smoothly and positively stops the vertical movement and prevents creeping.

(Information supplied by Argonne National Laboratory, Dept. CP, Lemont, Ill.)

Optically determining small amts of oxygen in an inert gas . . .

pass known quantity of gas over an active sodium surface until all 0_2 is absorbed

Until recently there has been no satisfactory way of determining extremely small amounts of oxygen in the presence of an inert atmosphere. The following describes a physical method of measuring oxygen concentrations from much less than 1 ppm to several ppm. It involves an optical measurement of the thickness of an oxide film produced by passing a known quantity of gas over an active sodium surface until all the oxygen present has been taken up by the sodium.

Method of Analysis

Method consists of an incomplete measurement of the optical constants of a metal. These constants, n, the refractive index, and k, the absorption index, are determined by observing the change in the state of polarization of monochromatic plane polarized light upon reflection from a metallic surface.

For the present case, the light polarized at 45° to the plane of incidence is allowed to fall on the metallic surface at one fixed angle of incidence. Phase difference introduced by the reflector is restored to zero at the fringe positions of a Babinet

compensator. Fringes are made as dark as possible with an anlyzing Nicol prism.

As the sample gas is passed over the sodium surface, the presence of the thin oxide film formed causes a shift of the fringe positions. This shift, accurately determined with a micrometer adjustment of the Babinet compensator, is proportional to the film thickness, provided the film is not so thick that it has become "bulk" oxide. As this limit is reached, the light no longer penetrates the oxide as far as the base metal, and only the reflecting property of the oxide is observed. Hence the method is applicable only to thin films.

Technique

Sodium for the absorption of oxygen is prepared in a molded glass envelope. The metal is heated in an atmosphere of helium (to prevent distillation to cooler parts of glass) to 135°C for a few minutes and then cooled suddenly. Large crystals are produced which give a flat mirror-like surface suitable to the optical measurements.

When the oxygen is introduced, it was found that having a small amount of nitrogen present serves to "sensitize" the sodium surface and hasten oxygen uptake. It is necessary only that the nitrogen be present as the oxidation begins. Experiments show that if the nitrogen is removed after an initial oxidation, subsequent oxidation still takes place rapidly.

Results

It is found that throughout the thickness range 60 to 2000 Angstrom units, the fringe displacemen is linear. This corresponds to amounts of oxygen ranging from four to five micron-liters to 150 micron-liters.

Reliability of method depends on obtaining pre-sensitized surfaces of sodium with no pre-exposure to oxygen and also on the care taken in attaching gas sample system to the sodium envelope tube. The pre-sensitization merely requires sealing in a quantity of nitrogen. With these two points taken care of, the analysis is straightforward; the fringe settings require only a little practice for reproducibility.

(From report KAPL-519 by James W. Moyer and Wm. A. Ruggles and issued by Knolls Atomic Power Laboratory, Operated for U. S. Atomic Energy Commission by General Electric Co., Schenectady, N. Y.)

High-frequency sound waves can locate flaws in small diam. tubing . . .

any discontinuity will reflect wave back to searching unit which presents it on a reflectoscope

Prior to development by group at Knolls Atomic Power Laboratory of method described below, no satisfactory means of detecting and measuring defects in small- diameter, thin-walled tubing had been available.

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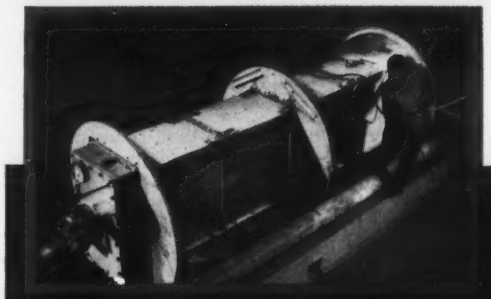
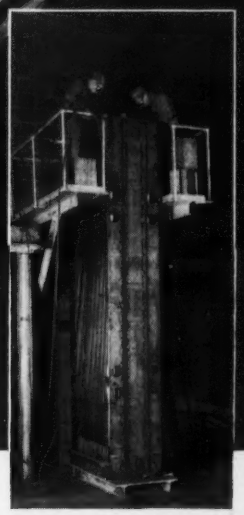


Each heat exchanger is individually hydrostatically tested to insure against leakage during operation. While under test, the by-pass baffles are welded on the unit.

One of the many wind tunnel heat exchanger sections, ready for shipment and installation in the Langley Aeronautical Laboratory supersonic wind tunnel, Langley Field, Virginia.

New **Supersonic** Wind Tunnel Coolers are A. O. Smith **Engineering Achievement**



Assembling tubes into the tube headers for one of the heat exchanger sections.

All wind tunnel coolers for the new supersonic wind tunnel under construction at Langley Aeronautical Laboratory of NACA, Langley Field, Virginia, were supplied by us.

A. O. Smith engineers conceived an original design in these heat exchangers, incorporating many advantages. The most important ones are:

1. High efficiency through balanced distribution of surface and flow areas.
2. Removable tube bundles.
3. Safety from air contamination by water, through elimination of bolted joints inside the tunnel and placing all water lines and connections outside air chamber.

These and many similar features make this one of the most advanced engineering feats in cooling provision for wind tunnels.

Besides manufacturing varying sizes and arrangements of heat exchangers, we also designed cooler housings, accessory equipment, and air by-pass system, calculated ducts and provided installation.

This is an excellent *example* of the completeness and flexibility of A. O. Smith engineering which is available to you to help solve YOUR heat exchanger problems . . . available through our nearest office, listed below.

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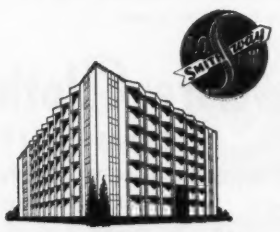

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Study the shape of the solids in your solution being filtered. That's just as important as the size, if you want clarity of filtrate. Then write us fully about the solids and we'll be glad to recommend the weave of the cloth that will "stop" them.

Many malleable metals are still available so, if necessary, we can probably supply you with a material that will also withstand highly corrosive conditions. When writing, also give solution characteristics.

All Newark Filter Cloths are woven in our own plant, on our own looms, by our own skilled weavers.

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SUMMARY

By means of high-frequency pulsating sound waves sent into the tubing to be tested—0.060 in. ID x 0.080 in. OD—flaws are located by reflection of the sound waves from the defect. Any discontinuity, as well as the opposite end of the tubing, will reflect the wave back to searching unit which presents it on a reflectoscope.

In the testing of thin-walled tubing, a shear wave is generated by an angle quartz crystal, and is sent angularly into the tubing being tested. Research group at KAPL found best results to be obtained with a 1-mc, 1-in. quartz crystal, searching unit.

EQUIPMENT

A standard model Sperry No. 50E351 Reflectoscope was used in the test procedures.

Pulse Transmitter. Sends out to amplifier and searching unit a short, high-frequency electric pulse at a low repetition rate.

Searching Unit. Receives electrical pulses from pulse generator via coaxial cable and transforms them, by means of a piezoelectric quartz crystal, into mechanical vibrations and transmits them into the material being tested. It also is acted upon by the mechanical vibrations reflected from the material and transforms these back into electrical pulses which are delivered to the amplifier.

Amplifier. Receives pulse from transmitter and incoming pulses from searching unit, amplifies them, and applies them to the vertical deflection plates of cathode-ray tube.

Sweep Circuit. Energizes horizontal deflection plates of cathode-ray tube to create the sweep of the electron beam.

Other equipment in set-up are a synchronizer, marker circuit, a holder for the tubing and camera to photograph the reflectograms.

CALIBRATED NOTCH

Size of the defects found in any given number of tubes of the same type was measured and compared with a standard calibrated notch made on similar tubing. The calibrated notch, which in this case was 0.001 in., was made approximately 4 to 8 in. from one end of a standard piece of tubing. The calibrated notch could not be placed too close to one end of the tube as the end reflection interfered with the interpretation of the calibration.

SENSITIVITY

Maximum sensitivity adjustment of the reflectoscope was not required to obtain good results for interpretation of small size defects. The sensitivity for each reflectogram taken was increased just enough to give a vertical back reflection indication equal to the height of the screen. By this method, the defect indications in the reflectograms were shown comparable to the back reflection. (From report KAPL-808 by A. J. Pardus and issued by Knolls Atomic Power Laboratory, Operated for U.S. Atomic Energy Commission by General Electric Co., Schenectady, N.Y.)

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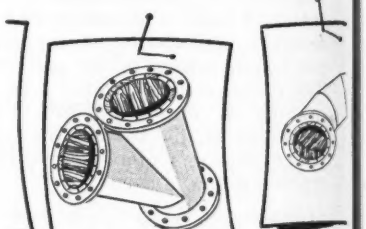
MPC Wood-Lined Steel Pipe is the efficient and economical answer **wherever corrosion, abrasion, frictional resistance or sliming is a problem.**

Ideal for corrosive liquids, gases and fumes including aggressive waters, industrial waste liquors, pulps, slurries, acid, alkali and salt solutions.

For service up to 180° F. and 250 p.s.i. Higher pressure ratings for special service requirements. All pipe flanged and available in 10' and 20' standard lengths or "tailor-made" to your specifications. Easy to cut and reflange. All flanges have standard ASME bolt circle.



Woodlined fittings are available in standard and special designs for all diameters. For catalog and additional information write Dept. CP.

EST. mpc 1869

MICHIGAN PIPE COMPANY

Bay City • Michigan

Manufacturers of Wood-Stave, Saran Rubber-Lined, Stainless Steel and Monel Piping. Represented nationally by Saran Lined Pipe Co. Detroit, (Ferndale) Michigan.

When inquiring check CP 1791 on handy form, pgs. 2-3

Source 3-X more powerful than any leaving AEC control . . .

used to study industrial applications of nuclear energy

Largest radioactive source outside of AEC installations was recently delivered to a research organization. Rated at 4500 curies, it is three times more powerful than any other quantity of radioactivity the AEC has permitted to leave its control.

Source itself, cobalt-60, comprises four cylinders and a rod. Each are a foot long, and they can be nested or used in various combinations. Weighing ten pounds when combined, the five elements are separately rated at 1480, 1200, 1100, 680 and 110 curies. Source will be in a laboratory tank of 5400 gallons of water — for shielding purposes — and will be used to study industrial uses of nuclear energy.

Service will be provided companies wishing to explore uses of radiation for their processes or products. Samples may be brought to the research organization for irradiation at specified intensity and duration. Considerations will be given to the economics and industrial practicability of the processes studied.

(Information submitted by Stanford Research Institute, Dept. CP, Stanford, Calif.)

Describes 23 patents from AEC

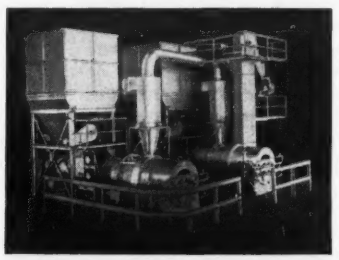
A three-page list gives number, title, inventor, and abstract of 23 patents owned by the U.S. Government and held by the Atomic Energy Commission which have been transmitted to the U.S. Patent Office for registry. Among the 23 are described the following: portable radiation detection device, method of liberating radioactive carbon dioxide from an alkaline earth carbonate, method for preparing boron trifluoride, and a remote control pipetting unit.

Patent list, January 30, 1953, is issued by U.S. Atomic Energy Commission, Washington 25, District of Columbia.

For more information on product at right, specify CP 1792 . . . see information request blank between pages 2 - 3

rotary kiln **Burns Waste**

Special Stainless Steel Batch Dryer for Drying Fine Catalyst without Dust Loss.



Two Complete Drying Systems, Can Be Operated Together—or Singly—to Meet Varying Plant Requirements.

. . . provides easy, economical, smoke-free disposal of still and tank bottom sludge, office waste, rags, food waste, and other oil refinery, industrial or commercial wastes.

● Material to be burned is raised in the skip bucket and fed into the brick lined kiln with a specially designed feeder. Kiln can be rotated at various speeds, permitting the burning time to be altered to meet changing requirements. Ashes are collected in the brick chamber. An auxiliary oil burner is provided for use when the materials are not readily combustible. Consult Bartlett-Snow on your next drying, cooling, calcining, waste disposal or other heat engineering problem. Our wide experience can save you both time and money!

DESIGNERS ENGINEERS **BARTLETT-SNOW** CLEVELAND 5, OHIO FABRICATORS ERECTORS

Dryers • Coolers • Calciners • Kilns

"Builders of Equipment for People You Know"

CHEMICALS
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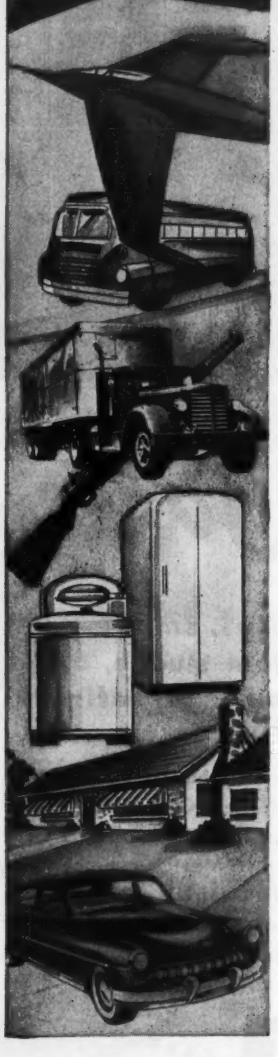
phosphate coating chemicals

TO MAKE YOUR PRODUCT DURABLE



PAINT BONDING

"GRANODINE"® forms a zinc-iron phosphate-coating bond on sheet metal products—automobile bodies and fenders, refrigerator cabinets, etc.—for a durable, lustrous paint finish.

"LITHOFORM"® makes paint stick to galvanized iron and other zinc and cadmium surfaces.

"ALODINE",® the new ACP protective coating chemical for aluminum, anchors the paint finish and protects the metal.

RUST PROOFING

"PERMADINE",® a zinc phosphate coating chemical, forms on steel an oil-adsorptive coating which bonds rust-inhibiting oils such as "Granoleum."

"THERMOIL-GRANODINE"® a manganese-iron phosphate coating chemical, forms on steel a dense crystalline coating which, when oiled or painted, inhibits corrosion.

PROTECTION FOR FRICTION SURFACES

The oiled "THERMOIL-GRANODINE" coating on pistons, piston rings, cranks, camshafts and other rubbing parts, allows safe break-in operation, eliminates metal-to-metal contact, maintains lubrication and reduces the danger of scuffing, scoring, galling, welding and tearing.

IMPROVED DRAWING AND COLD FORMING

"GRANODRAW"® forms on pickled surfaces a tightly-bound adherent, zinc-iron phosphate coating which facilitates the cold mechanical deformation of steel, improves drawing, and lengthens die life.

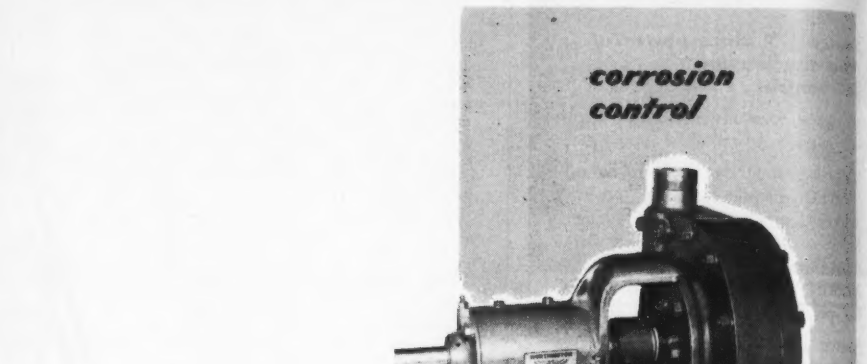
Send for descriptive folders and Government specifications chart on the above chemicals. Write or call for more information on these products, and advice on your own metal-working problem.

AMERICAN CHEMICAL PAINT COMPANY

***General Offices:* Ambler, Penna.**

Niles, Calif. Detroit, Mich. Windsor, Ont.

When inquiring check CP 1793 on handy form, pgs. 2-3



Plastic pump is shown assembled and with casing cover removed. As illustrated, every part of the pump in contact with acid is non-metallic material

Hydrochloric Acid Handling Problem Solved with Plastic Pumps

General Electric's Chemical Div. has used five of the pumps for periods of up to 33 months of continuous operation in the corrosive service without need for any replacement parts

PROBLEM: At the General Electric Co. plant in Waterford, N. Y., where silicones are manufactured, pumps that were being used for handling hydrochloric acid were "down" about 20% of the time, delaying production, and causing numerous other difficulties. Pumps were needed which would be able to stand up under the corrosive effects of the hydrochloric acid.

Problem arose initially as a result of operations involving hydrolysis of chlorosilanes in the silicone manufacturing process. Reaction consists of passing the chlorosilanes into a water-solvent mixture in a reaction kettle. Reaction produces hydrogen chloride gas, which is absorbed in water by contact in porcelain-lined absorption towers packed with beryl saddles. Result is a solution of hydrochloric acid which averages 25% in strength, usually varies from 0 to 30%, and is as high as 38% on occasion. Temperature of the acid runs about 104°F maximum.

Solution: Five plastic centrifugal chemical pumps with non-metallic mechanical

seal were acquired and put into operation. The first pump which was installed has been in continous operation for approximately 33 months.

Every part of the pump in contact with acid is non-metallic material. Haveg was selected by the pump manufacturer as the plastic used for the principal parts of the pump in contact with the acid, due to its wide range of resistance to chemical attack, and for its relatively high strength.

Semi-open type impeller is of the same plastic as the casing and suction head. Shaft is steel, protection being provided by plastic sleeve and Teflon gasket. Mechanical seal parts are entirely non-metallic. Bushing is Graphitar 42 or porcelain. Bushing clamp is Haveg with monel bolts, cooling water being provided by means of a short piece of Saran tubing with pipe thread connection. Seal ring and shaft sleeve are either of Haveg or carbon. Back-up ring for spring compression is Haveg with Worthite set screws. Compression ring and spring, not in contact with the acid, are Worthite.

Pump has standard cast iron frame. Line bearing is protected by grease seal between bearing and cover. Frame is coated with acid resisting paint. Plastic drip pan under seal protects the cast iron, should leakage occur from wear.

Results: Pumps have been found to provide good service in handling the hydrochloric acid for periods up to the 33 months continuous operation for the unit first installed. When first pump was placed in operation some trouble developed but it was found to be due to improper water connections to lines used for cooling the seal. In fact, the people at General Electric in Waterford feel that one of the secrets of the successful operation of the pump is the water-cooled seal. Furthermore, G. E.'s experience with the pumps has been so foolproof that they have not used any spare parts for replacement since the pumps were put into operation.

(Haveg plastic centrifugal pumps in use at General Electric Co., Chemical Division, in Waterford, N. Y. are products of Worthington Corp., Dept. CP, Harrison, N. J. . . . or for more information check CP 1794 on handy form, pages 2 and 3.)

Corrosion losses cut by resistance of aluminum alloys to chemically contaminated atmospheres . . .

withstands H_2S, SO_2, CO_2, NH_3, and other products in a variety of applications and industries

High resistance of aluminum alloys to chemically contaminated atmospheres has reduced corrosion losses in a variety of applications in a number of different types of industries. Applications include electrical uses, roofing and siding, piping, tanks, heat exchangers, instrument tubing, ducts, general metal work, towers, and shafts. Industries covered are plants handling salt, organic chemical plants, refineries, alkali producers, and by-product coke plants, among others. One reason for the good performance is the "self-stopping" nature of the attack, by which

(*Continued on next page*)

TYGON

the economical answer to expensive corrosion problems

Tygon is the generic name for a group of plastic compounds specifically designed to combat corrosion. Based on a series of selected polyvinyl resins, TYGON offers outstanding protection against both acids and alkalies plus oils, greases, water and most solvents, except esters, ketones and certain aromatic hydrocarbons. The various forms of TYGON available make its proper application a simple matter for many uses in many industries under many conditions.

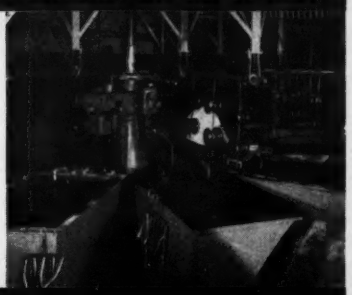
As tubing

TYGON PROVIDES SAFE TRANSMISSION FOR VIRTUALLY ANY LIQUID, GAS OR SEMI-SOLID

TYGON Tubing is widely used in both plant and laboratory. In the "lab," TYGON'S glass-like clarity, full flexibility, smooth surfaces, non-contaminating and non-oxidizing properties make it quicker, easier, safer and cheaper to use in the most intricate "set-ups" or with the most delicate solutions. In the plant, these same properties plus its light weight, high strength, excellent abrasion resistance and easy installation, give TYGON tremendous advantages over conventional piping. TYGON Tubing is available in six standard formulations, in clear or glossy black, with a wide range of physical, chemical and electrical properties. Sizes range from .12" I.D. to 2" I.D. Braided jacket reinforcement in fabric, plastic and stainless steel is also available for use with constant working pressures up to 300 psi.

As linings

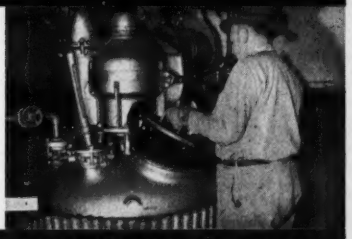
TYGON OFFERS HEAVY DUTY PROTECTION TO EQUIPMENT OF PRACTICALLY ANY SIZE OR SHAPE



TYGON press-polished sheeting in thicknesses of 3/32" or 3/16" makes it ideally suited to the protection of tanks, tank cars, diffusional towers, vats, reactors, bins, hoppers, troughs, pipe and other processing equipment against a wide range of chemicals. Its unique resistance against oxidizing acids, oils, greases and certain solvents permits the use of TYGON in jobs other linings cannot handle. Its wear resistance assures long life with the most abrasive materials. Its flexibility permits close conformance to the most intricately shaped equipment. Its lack of the need for "curing" makes possible installations of virtually any size. TYGON, for lining work, is available in two standard compounds—TL 104 (Black) for general use and TL 104-A (White) where solution visibility is desired.

As gasketing

TYGON PROVIDES POSITIVE, ENDURING SEALS FOR ALL TYPES OF PROCESSING EQUIPMENT



Die-cut, molded, or extruded, TYGON is the sure answer to tough gasketing jobs in chemical processing or general industrial equipment. Its chemical resistance, abrasion resistance, resilience, high strength, non-contaminating and non-oxidizing properties make it practical to use under a wide range of operating conditions. TYGON gaskets can be die-cut from calendered or press-polished sheeting (1/64" to ½" thick); can be molded in practically any size or shape; can be extruded as tubing, solid cord, strip, or channel in continuous lengths. A number of standard compounds are available.

As paint

TYGON OFFERS EASILY APPLIED, LASTING PROTECTION AGAINST CORROSIVE FUMES AND SPILLAGE

As a paint, TYGON is primarily used to protect plant and equipment against corrosive fumes and spillage. It is also used against immersion in mild corrosives or to prevent contamination of delicate solution. TYGON Paint is easily applied and quick drying. Dry, its film is chemically resistant, tough, flexible, and smooth; resistant to cracking, chipping or crazing. There are two types of TYGON Paint available. TYGON "Series K" Paints do not require a primer and are used against mild corrosion. TYGON "Series TP" Paints are for use with primers under severe conditions of corrosion. TYGORUST, the "no-prep" vinyl primer is recommended for use under either type of TYGON PAINT on rusted metal—wet or dry.

4K7C

Why not solve your corrosion problems with the versatile TYGON? Write, today, for full information about this plastic of many uses.

U. S. STONEWARE CO. . . . . AKRON 9, OHIO

When inquiring check CP 1795 on handy form, pgs. 2-3

(*Continued from preceding page*)

the rate of penetration of the metal decreases with the passage of time.

Among the corrosives resisted are hydrogen sulfide, sulfur dioxide, carbon dioxide, hydrogen chloride, and organic vapors. Laboratory tests indicate a metal loss of .0003 to .0010 inches per year for alloys 2S-H14 and 3S-H14 in either hydrogen sulfide or carbon dioxide atmospheres. Same alloys had penetration of .03 to .05 for sulfur dioxide. Data on actual exposures in plants for a number of years, which will be presented later, shows a lower penetration due to the "self-stopping" action over long periods.

In addition to resisting corrosive gases, aluminum alloys withstand the action of chemical dusts present in the atmospheres of many plant areas. In a study, a large number of solid chemicals, such as sodium chloride, sodium acetate, sodium nitrate, ammonium nitrate, ammonium sulfate, and calcium oxide among others had no effect on aluminum. Samples were exposed for one month at room temperature at 100%

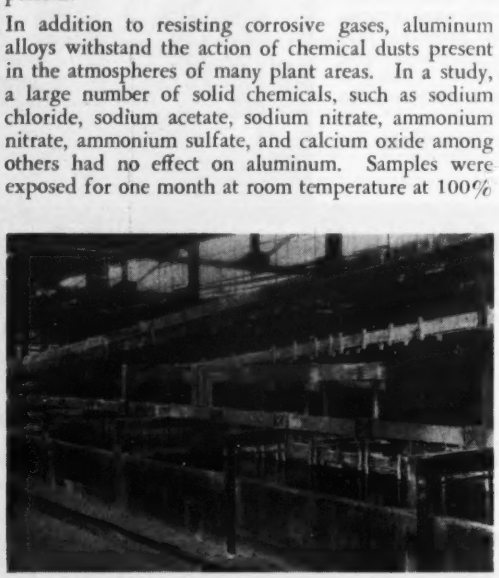


Fig. 1—Although heavy salt deposits have covered this aluminum alloy bus bar at times, no serious corrosion has resulted since it was placed in service over electro-zinc galvanizing baths in 1930.

humidity. Even such a chemical as aluminum chloride, classified as corrosive by this rather severe test, was found to have no effect on aluminum alloys in a field test after 7½ months exposure.

In order to illustrate the resistance of aluminum alloys to chemically contaminated atmospheres more fully in actual practice, installations will be described according to particular applications as follows:

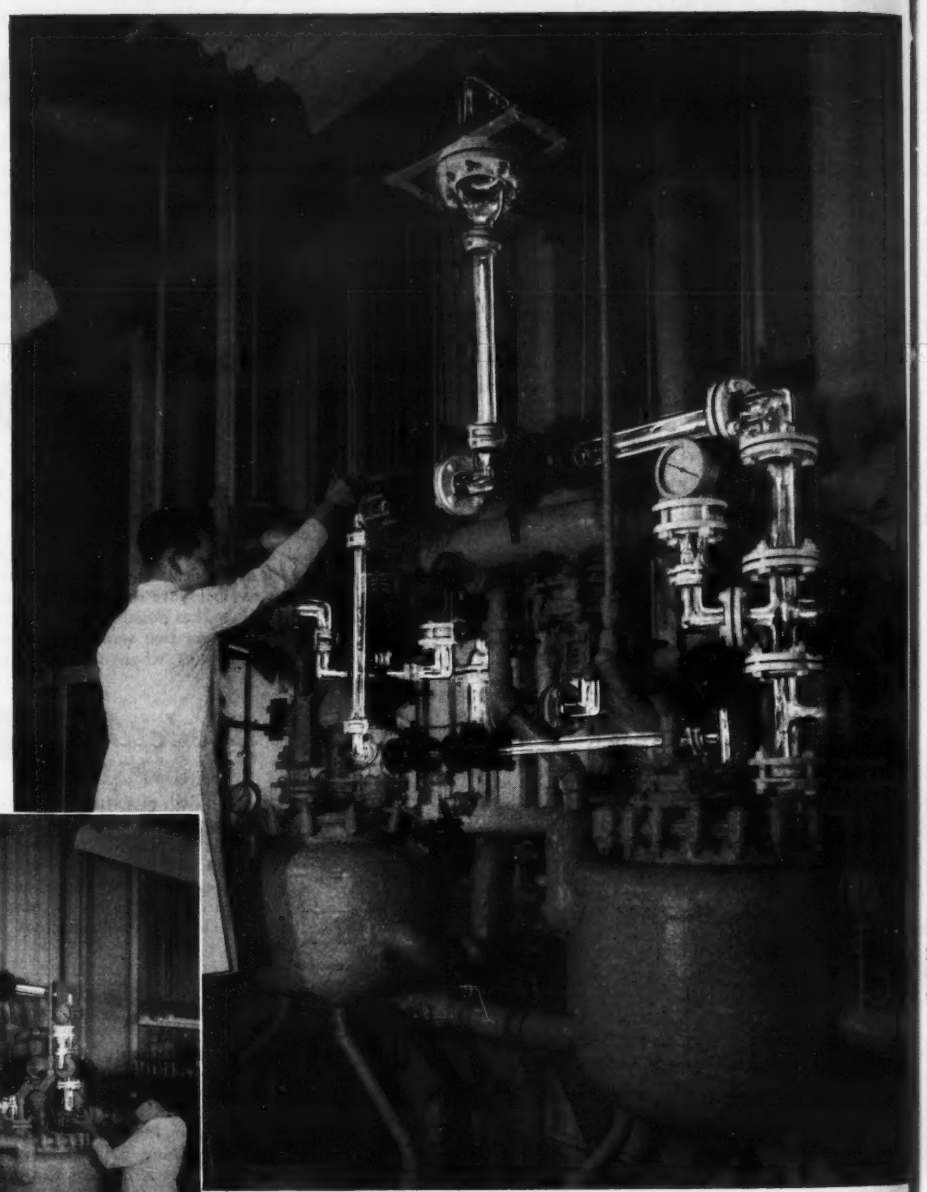
Electrical

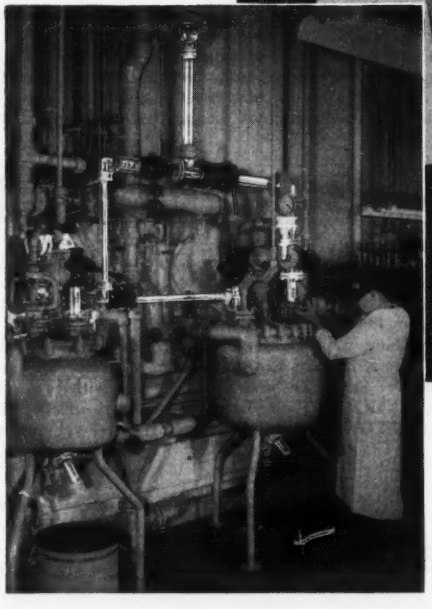
Aluminum alloys have been used as bus conductors since 1895. Resistance to salt is shown by aluminum alloy bus bars over electro-zinc galvanizing baths since 1930, as illustrated in Fig 1. Although heavy salt deposits have covered the bus at times, no serious corrosion resulted. Excellent service has been provided in other installations around electrolytic cells and in plating rooms where metal has withstood atmospheres contaminated with chlorine, sulfuric acid, cyanides, and cadmium oxide.

Other electrical applications around chemical operations include sub-station structures, conduit, and

How CALCO uses PYREX® pipe i proc

Jacketed kettles cross-connected through PYREX® br ass pipe





The Jacketed kettles shown in the two views of this Calco test-run installation supply experimental products to a glass heat exchanger through 1″ and 2″ PYREX brand "Double-Tough" glass pipe and fittings, and a 3″ glass vapor trap. Teflon gaskets are standard. Temperatures range from 125°C. to −10°C. Pressures from 14 PSI to a vacuum o 29″ of mercury. The pH range is fro "very low" to 10. In the left-hand pi ture the operator is charging one of t kettles with concentrated acid. In t right-hand picture, he is making valve adjustment.

The pu manufac Divisio Compan N. J. pl much gla

The tw trated he pharmac on a pro laborato handled ceutical variety o

Accor Assistan cal Res flexibilit ered unl

PYREX your exa beaded o with the

Corning available to other nozzles. C

processing pharmaceuticals

ass pipe permit either distilling or refluxing

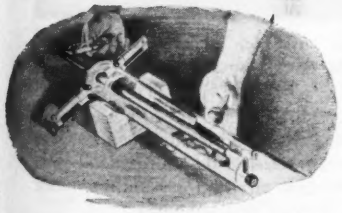
The purity of pharmaceuticals manufactured by Calco Chemical Division, American Cyanamid Company, in its Bound Brook, N. J. plant requires the use of much glass processing equipment.

The two-still installation illustrated here is used to test run new pharmaceuticals and intermediates on a production scale a step above laboratory operations. Materials handled cover the entire pharmaceutical field, and involve a wide variety of corrosives.

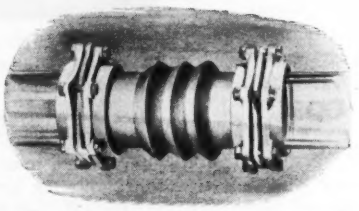
According to Dr. J. M. Smith, Assistant Manager of Pharmaceutical Research, this installation's flexibility of operations is considered unlimited so far as pharmaceuticals are concerned. Part of its flexibility is due to the manner of cross-connecting the kettles so that it is possible to distill or reflux from either kettle. Most frequently, the kettles are used independently, or alternately, according to need. Both feed into one condenser.

This is only a small example of Calco's use of PYREX brand "Double-Tough" glass pipe in the production of pharmaceuticals and intermediates. Its other six plants use PYREX pipe wherever corrosion or product purity are problems. You will find it well worth your time to check the many advantages PYREX pipe offers.

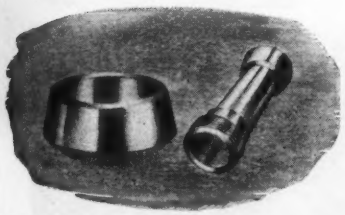
Installation Tips



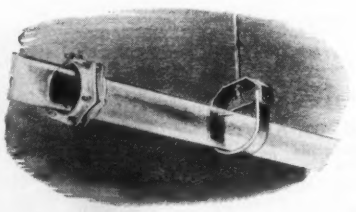
PYREX pipe can be prefabricated to your exact measurements or cut and beaded on the job by your own men with the aid of a simple tool kit.



Where excessive vibration is encountered, a Teflon bellows may be used in the line. Adjustable glass joints and spacers permit wide flexibility of layout.



Corning adapter flanges or ferrules are available for connecting PYREX pipe to other pipe materials, valves, or tank nozzles. Complete fittings also available.



Pipe hangers can be the same as used for metal pipe. It is recommended that some resilient material be used as padding to prevent scratching of glass.

The PYREX pipe distributors listed below carry the complete line

Contact the one nearest you:

BELMONT, CALIFORNIA
Glass Engineering Laboratories

FRESNO 17, CALIFORNIA
Valley Fdy. & Mach. Works

NEW HAVEN, CONNECTICUT
Macalaster Bicknell Company

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Southern Scientific Company

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Fred S. Hickey, Inc.

NEW ORLEANS, LOUISIANA
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Macalaster Bicknell Company

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Will Corporation

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PITTSBURGH 19, PA.
Fisher Scientific Company

HOUSTON 7, TEXAS
W. H. Curtin & Company

SEATTLE 4, WASHINGTON
Scientific Supplies

TORONTO, ONTARIO, CAN.
Fisher Scientific Co., Ltd.

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Fisher Scientific Company, Ltd.

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CORNING GLASS WORKS
Dept. PR-6, Corning, N. Y.

Please send me the printed information checked below:

☐ "PYREX brand "Double-Tough" Glass Pipe and Fittings" (EA-3)

☐ "PYREX brand Glass Pipe in the Process Industries" (EA-1)

☐ "PYREX Cascade Coolers" (PE-8)

Name_____

Title_____

Company_____

Street_____

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Zone____ State_____

When inquiring check CP 1796 on handy form, pgs. 2-3

cable. When cable was installed adjacent to a sulfuric acid plant, it was found to have max depth of attack of only .0028 inch after 20 years service.

Roofing and Siding

Resistance of aluminum roofing is indicated by roof on company's own New Kensington plant installed

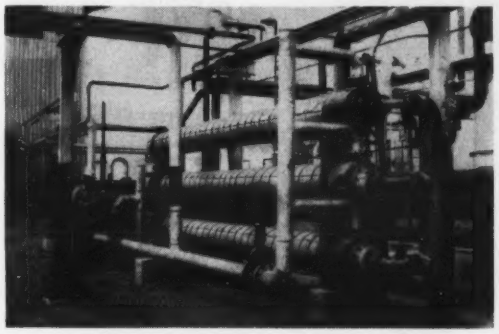


Fig. 2—Aluminum alloy siding and piping in an organic chemical plant

in 1922. Roof was exposed to industrial gases outside and to an acidic atmosphere inside. After 24 years service, outside surface was still in excellent condition, having a maximum depth of attack of .005 inches. Maximum depth of attack inside under the more corrosive conditions was .012 inches. Other

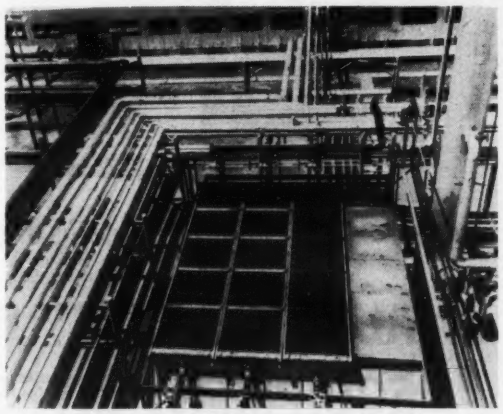


Fig. 3—Air cooled aluminum fin and tube exchanger handling hydrocarbons

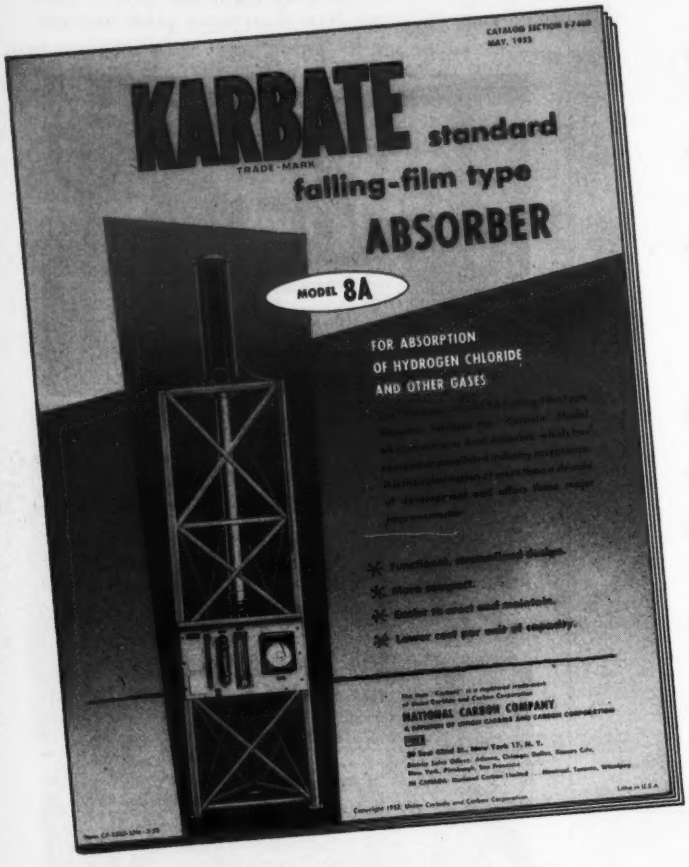
similar installations of roofing and siding have been found to provide good resistance to atmospheres contaminated by calcium sulfate, sulfuric acid, lime, soda ash, caustic soda, ammonia, sulfur compounds, and phenol.

When corrosive conditions are encountered, the attack is usually of the pitting type. It has been found that the life of roofing and siding is further enhanced by alclad sheet. Alclad is a duplex aluminum alloy to which is metallurgically bonded a thin aluminum alloy coating. Cladding alloy has a potential

(*Continued on next page*)

NATIONAL CARBON OFFERS

LOW-COST PRODUCTION WITH NEW "KARBATE" BRAND STANDARD HCl ABSORBER



- PRODUCES UP TO 20 TONS PER DAY OF 22° BAUMÉ HCl
- PNEUMATIC AUTOMATIC CONTROL
- STANDARD ACCESSORIES: SUPPORT FRAME, MIST ELIMINATOR, NON-SIPHONING SEPARATOR
- COMPACT, LIGHT WEIGHT
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Write For New Catalog Section S-7460

...ALL "KARBATE" BRAND IMPERVIOUS GRAPHITE EQUIPMENT GIVES YOU:

- OUTSTANDING CORROSION RESISTANCE
- COMPLETE IMMUNITY TO THERMAL SHOCK
- FREEDOM FROM METALLIC CONTAMINATION
- LONG LIFE—LOW MAINTENANCE

The term "Karbate" is a registered trade-mark of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.
District Sales Offices:
Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco
In Canada: National Carbon Limited, Montreal, Toronto, Winnipeg

When inquiring check CP 1797 on handy form, pgs. 2-3

(*Continued from preceding page*)

such that it will cathodically protect the core metal from pitting attack.

Use of aluminum for roofing and siding eliminates the need for paint and keeps maintenance to a minimum. This is illustrated in Fig 2, which shows an organic chemical plant in which aluminum is being successfully used for siding and also for piping.

Piping

Piping must be maintained on the outside as well as be able to handle a specific material. Another example of the advantages of aluminum for application, in addition to that shown in Fig 2, is the use of the material for piping across a sulfur storage area.

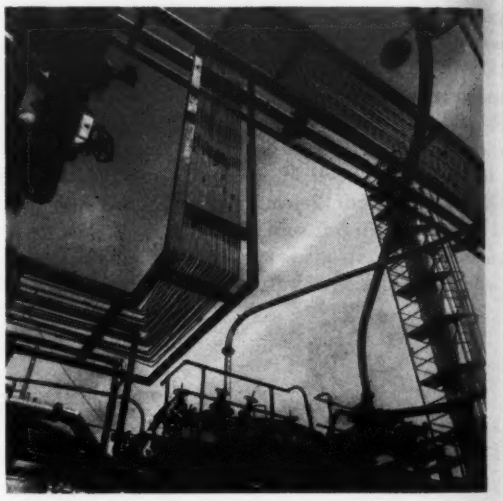

Fig 4—First large installation of aluminum instrument tubing in a refinery

After 14 years exposure to sulfur dust and rain, outside of piping was etched and roughened but was not attacked to any appreciable depth. Several soda ash plants use aluminum piping for handling moist mixtures of carbon dioxide and ammonia.

Tanks

A demonstration of the resistance of aluminum alloys to the vapors of sour crude oils is shown by the long

(*Continued on next page*)

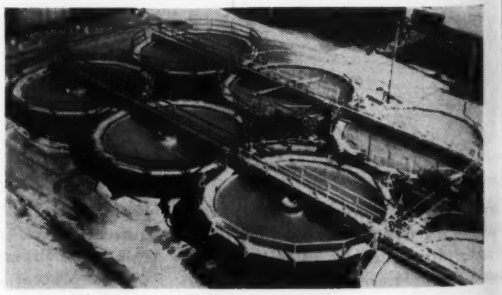

Fig. 5—Aluminum alloy bridge over alkaline brine settling tanks in a soda ash plant in good condition after five years of service

life of aluminum tank roofs, some of which have been in service for more than 20 years. Since 1927 nearly 100 aluminum tank roofs have been installed.

Heat Exchangers

Heat exchanger shown in Fig 3 is being used by an oil company in New Mexico for cooling hydrocarbons. Similar units of this type are being used for cooling oil and water. Heat exchangers have been found to resist sulfur gases, water vapor, and a variety of other atmospheric conditions.

Instrument Tubing

Superiority of aluminum instrument tubing where atmospheres containing hydrogen sulfide and sulfur dioxide are encountered was recognized early by gas and oil processing plants. A typical example of one of the first large installations of aluminum tubing is shown in Figure 4.

Ducts

Exhaust ducts fabricated from 2S aluminum sheet and placed in service in company's research laboratories have been exposed to a varied corrosive environment. Ducts not only handle fumes from analytical work but also fumes and vapors from corrosion research tests. After 18 years of such service, average depth of attack was .0052" and maximum depth was .0308 inch.

General Metal Work

While soda ash, being alkaline, may be corrosive to aluminum alloys, experience has shown that there are many places around soda ash plants where they are preferred. One such location is shown in Fig 5, over alkaline brine settling tanks. This 61S-T6 aluminum alloy bridge is in excellent condition after five years service.

Tower and Shafts

An aluminum prilling tower 20 feet in diameter and 120 feet high has been found to give good service in an ammonium nitrate plant. The outside of an aluminum desulfurization column in a by-product coke plant was unaffected after 10 years of service. Hydrogen sulfide made this area unusually corrosive to

(*Continued on next page*)

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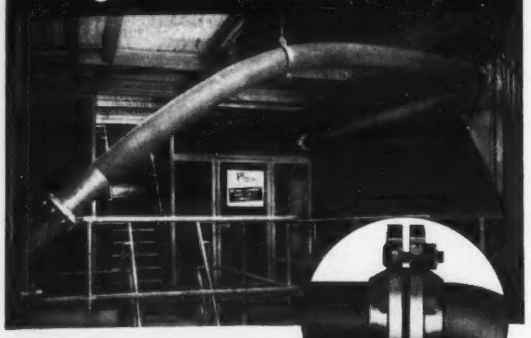


"GOODITE" FLEXIBLE RUBBER PIPE

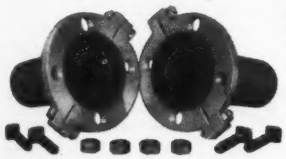
"Goodite" Flexible Rubber Pipe provides the most efficient and economical means of handling corrosive and abrasive materials, hot or cold, wet or dry. Maximum flexibility permits installation of long, curving lines with few intermediate connections; and even these are simplified by the use of "Flang-Lok" Floating Flanges.

The "Goodite" tube is highly resistant to severe abrasive wear and permeation of fluids or gases. The wire-reinforced carcass will not kink, buckle or collapse. The tough, long-wearing cover is impervious to the actions of acids or fumes. Standard sizes, 2" to 12", inclusive, in maximum lengths of 50 feet.

"KEMITE" DUCT has same characteristics as "Goodite", but is made in smaller sizes — ¾" to 4" — for lighter service.

"FLANG-LOK" FLOATING FLANGES

Designed to simplify the installation of "Goodite" Pipe and "Kemite" Duct, which are made with "Flang-Lok" ends. When these ends are joined with "Flang-Lok" Flanges, they form a non-metallic, tube-to-tube connection, of the same I.D. as the pipe or duct, which remains permanently leakproof. Bolt holes, of standard drilling, are easily aligned by turning flange, only. No gaskets are required.



"Flang-Lok" Flanges, made in sizes up to 96", are also used on Goodall Expansion Joints and certain types of Goodall hose having "Flang-Lok" Ends. Contact our nearest branch for details.

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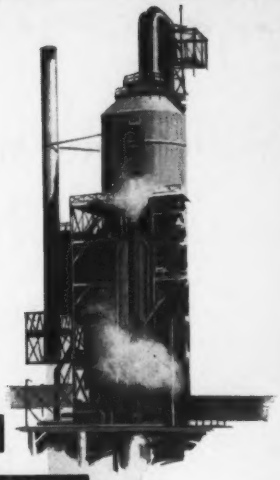

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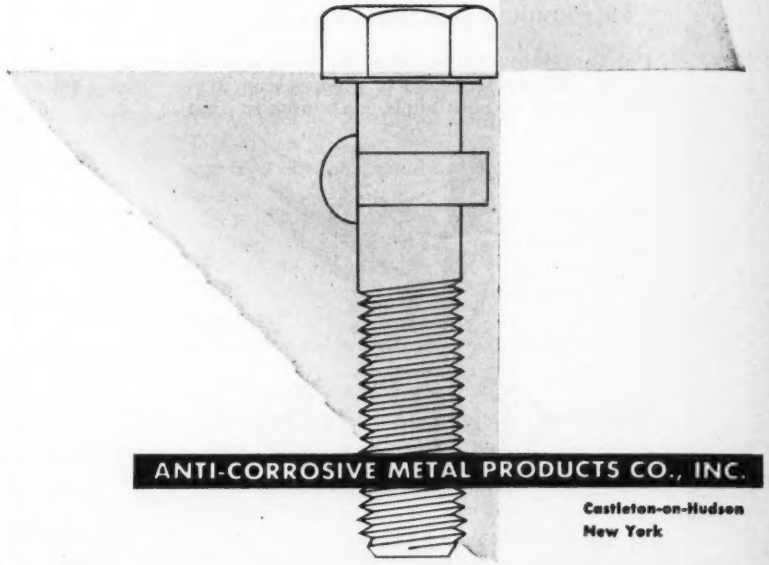


ANTI-CORROSIVE METAL PRODUCTS CO., INC.

Castleton-on-Hudson
New York

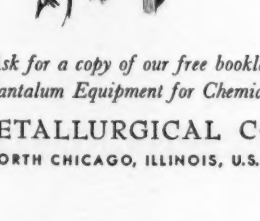
When inquiring check CP 1799 on handy form, pgs. 2-3

The single cost of TANTALUM is much less than the many costs of CORROSION...

Corrosion costs do not end simply with equipment replacement. A complete analysis must include shutdowns, lost production time, product contamination and spoilage, fume damage to buildings and associated equipment, possible injury to personnel. Compare this myriad of costs against the single outlay for Tantalum, the metal that is not merely "corrosion-resisting", but acid-proof.

If you are processing hot or strong acid solutions, if you are making a pure product in which equipment contamination or side reactions cannot be tolerated, tantalum is probably the most economical material of construction you can use. Experienced Fansteel engineers are at your service for consultation at no cost to you.

Use Tantalum with economy for most acid solutions and corrosive gases or vapors except HF, alkalis, or substances containing free SO_3.



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CORROSION CONTROL

(*Continued from preceding page*)

other metals, original stack having failed after three years service. In 1934 a 53S-F aluminum alloy man cage was installed in a salt mine shaft. It was removed in 1950 only because it was obsolete.

Aluminum alloys have also been found to resist chemically contaminated atmospheres in power houses around coal, in metal-working plants, in air conditioning uses, in waste disposal plants, and others. Cooperative field testing may demonstrate other applications where it can be used to advantage in preventing corrosion.

(Technical paper, "Resistance of Aluminum Alloys to Chemically Contaminated Atmospheres," was presented at the National Association of Corrosion Engineers Conference recently held in Chicago. The paper was written by W. W. Binger, R. H. Wagner, and R. H. Brown, of the Aluminum Co. of America, Dept. CP, Pittsburgh 19, Pa. . . . check CP 1801, pages 2 & 3.)

Valuable tool in corrosion testing available in coupon method . . .

paper describes details of procedure used by one oil and gas producing company

The valuable tool in corrosion testing known as the coupon technique can be worth even more if the details of the procedure are better understood. A recently published paper presents a detailed description of the procedure used by one oil and gas producing company. This method is said to have been quite accurate, particularly with gaseous systems. In liquid systems, variables not related to the corrosion processes have occasionally influenced results.

Coupons are small metal plates which are weighed and otherwise prepared for exposure. They are then exposed to corrosive fluids for a number of days, examined and cleaned of corrosive products after exposure and reweighed. Both qualitative and quantitative data are obtained.

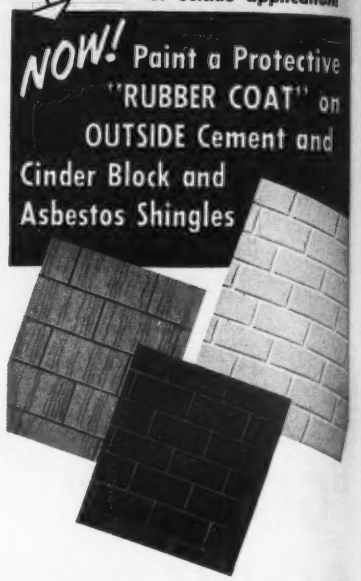
(Information obtained from paper, "The Coupon Technique—A Valuable Tool in Corrosion Testing," is by H. L. Bilhartz and H. E. Greenwell of The Atlantic Refining Co., Dept. CP, 260 S. Broad St., Philadelphia, Pa. It was published in Corrosion, Feb., 1953, pages 66 to 73 incl.)

No "dead-end" articles . . .

in fact, every article leads into two avenues of contact. First, we do publish at the end of all articles the names and complete addresses of companies who can give you specific information so that you can write direct. Or, there's the handy Reader Service slip which you can check and send to us.

THE EDITORS

For Industrial Paint Users!
The tough durability of rubber-base paint is now available for outside application!



Protect against wind-driven rain, surface deterioration, with Rubber-base Cementkote!

Brush on a tight coat of rubber that resists moisture penetration and preserves the original texture and pattern of the material used. Use on any masonry surface. Unaffected by alkalies. Does not streak, spot, "burn", crack or flake. New construction needs no curing wait, priming or preparation. Covers patched concrete perfectly. Rain simply washes it free of dust, dirt, smoke or soot. Not a gloss—dries smooth, flat. Seven colors and white.

FREE! **See how you can protect and decorate with Rubber-base Cementkote on outside surfaces. Your business letterhead request brings full information—write today!**

THE TROPICAL PAINT & OIL CO.
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Heavy-Duty Maintenance Paints Since 1883

TROPICAL
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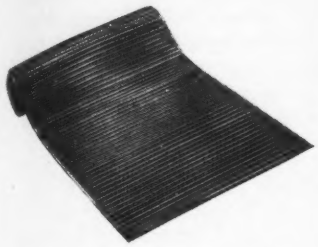
When inquiring check CP 1802 on handy form, pgs. 2-3

Synthetic rubber mat resists chemicals and grease . . .

particularly effective in preventing accidents

Uses: Applications include use in chemical processing plants, dairy and food processing plants, and experimental laboratories.

Features: Mat is said to be resistant to grease, oil, acid, alkali, and other chemicals. It is said to



Raised ridges of runner enable it to be easily cleaned

be especially effective in preventing accidents in plants where grease and oil are present.

Description: NIRU synthetic rubber from which mat is fabricated is reported to virtually eliminate deterioration from chemicals that may result with use of natural rubber. Non-slip characteristics of mat are provided by the sturdy, rubber cross-ribs.

Two colors are available at present, gray and white. It is 36″ wide and comes in any length up to 60′. Raised ridges facilitate cleaning.

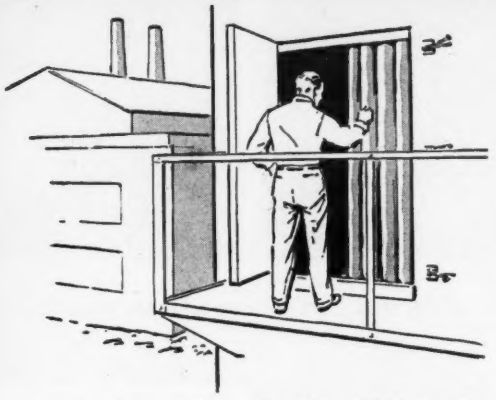
(Cross-Rib Runner is product of Wear Proof Mat Co., Dept. CP, 2156 W. Fulton St., Chicago, Ill. . . . or for more information check CP 1803 on handy Reader Service slip, pages 2 and 3.)

Pipe Wall Thickness Estimates? See pages 200 & 202 for a faster method.

For more information on product at right, specify CP 1804 . . . see information request blank between pages 2 - 3.

Filter bags of ORLON® help clear the air in Los Angeles

ACRYLIC FIBER



ALONG WITH the expansion of industry in the Los Angeles area came a serious problem—industrial air contamination. One of the local firms, The Lincoln Foundry Corporation, is doing its part towards cleaner air . . . with the help of filter bags of "Orlon".

Not long ago, solid particles and gases from the Lincoln Foundry's cupola were being discharged into the Los Angeles air. The problem was to reduce this emission from 174 lbs. per hr. to 13.58 lbs. per hr. . . . the limit required by the rules and regulations of the Los Angeles County Atmospheric Pollution Control District.

The Lincoln Foundry met the problem by installing a dust collector system made by the American Wheelabrator & Equipment Corporation. This system uses filter bags of "Orlon" to trap wastes at temperatures up to 275°F., and keep them from escaping into the air. Now, with the collector system installed, emission of waste from the cupola is reduced to a point where it can't even be detected, is far less than the requirement of the Pollution Regulation.

Filter bags of "Orlon" acrylic fiber were selected for this demanding job because of the fiber's remarkable properties. For "Orlon" is tough enough to resist corrosive gases . . . strong enough to withstand the periodic shaking which takes place automatically in this collection system. And its resistance to heat contributes to long, trouble-free service. After 13 months of continuous use, the filter bags of "Orlon" are still in excellent condition.

This is just one of the many cases where "Orlon" provides the answer to a tough problem . . . assures easy operation and lower operating costs. Currently "Orlon" is being used for both hydraulic and pneumatic types of filtration. And manufacturers are finding an ever-increasing number of new uses for this fiber—from weather-resistant convertible tops to good-looking work clothes that hold their press.

It will pay you to find out how "Orlon" can help you in your business. Write E. I. du Pont de Nemours & Co. (Inc.), Room 2522P, Nemours Building, Wilmington 98, Delaware.

ORLON is Du Pont's trade-mark for its acrylic fiber.

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Poly-surface or symmetrically shaped pellets...three degrees of porosity...seventeen different compositions. Chances are, the best support for you is among these—

Catalyst Carriers by "Carborundum"

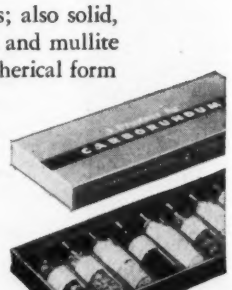
To satisfy the growing need for more specialized catalyst carriers, The Carborundum Company has available a variety of carriers of aluminum oxide, silicon carbide, and silica materials. The *greatest variety* in this field.

For example, among recent developments are irregular shaped pellets, termed Poly-surface. These provide improved adherence of catalyst, lower pressure loss, and lower density.

Because fluidized processes are becoming increasingly important, we have available small Poly-surface pellets that are individually porous. These absorb internally as well as externally, and expose the catalyst continuously, in spite of attrition.

All told, there are over two dozen *basic* types of carriers made by CARBORUNDUM. These include ceramically bonded Poly-surface, spheroidal, and cylindrical pellets; also solid, homogeneous aluminum oxide, silicon carbide and mullite grain. This mullite material is also offered in spherical form as a catalyst or heat exchange media.

A kit containing sample quantities of all our principal carriers is available. This is complete with technical literature and will be furnished free if request is made on company letterhead. (Otherwise only literature will be sent.) Please tell us if you are particularly interested in certain materials. Address: Dept. S-63, Refractories Div., The Carborundum Co., Perth Amboy, N. J.



CARBORUNDUM
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Organic protective coatings for corrosion control . . .

technical paper tells how to choose best finish

In a technical paper recently prepared at the Case Institute of Technology, the role of organic protective coatings in combating corrosion is covered. Theory of the use of a film of paint in retarding corrosion is first presented, describing how coatings function in their protective action. Then factors to be considered in the proper choice of a finish are given, illustrated by typical problems.

Section on theory illustrates the individual functions of the binder, the pigment, and the thinner in paint formulas. Another portion of the manuscript reviews three methods of applying liquid coatings to a surface. These are by dispersion of the resins in a carrier liquid, hot melt techniques, and application of mastics by troweling.

One part of the paper explains how protective coatings retard corrosion. With reference to the electrochemical mechanism of corrosion, organic coatings are classified into two types, (1) those that function primarily as barriers, and (2) those that assist polarization phenomena. Principal advantage of the first group is resistance to chemcal deterioration while the second class has superior adhesion. In the search for a protective coating, an effective compromise must be worked out which combines the best features of both groups. Balanced films of this type, when designed for a particular application, have been known to last 50 years.

In order to point out the considerations in the choice of a good coating, underground corrosion-resistant coatings for pipe are discussed. Factors emphasized for this application are important for other types of problems.

("The Use of Organic Protective Coatings in Controlling Corrosion," is by Edward G. Bobalek, of the Case Inst. of Technology, Dept. CP, Cleveland 6, Ohio. It was presented at the recent National Assn. of Corrosion Engineers Convention in Chicago.)

For more information on product at left, specify CP 1805 . . . see information request blank between pages 2-3.

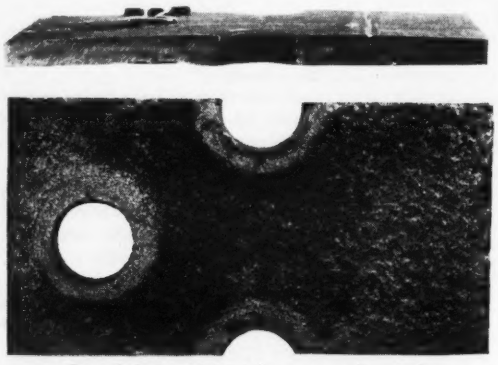
Slight changes in operating conditions can greatly increase corrosion rates of refinery equipment . . .

inspection system must guard against chemicals and localized attacks

Standard Oil Company of California's El Segundo refinery has found that very slight changes in operating procedures can have a marked effect on corrosion rates. A constant vigilance is maintained in their inspection procedures to prevent failures due to chemicals in the crude oil or those added in processing. Localized attacks are another potential source of trouble.

One case in point concerns increasing the feed rate of a crude distillation unit. First increase in feed rate of about 20% made corrosion rate higher but did not make it severe. An additional increase in feed rate of only 1% was made by increasing outlet temperature of the atmospheric furnace by 10°F. At the end of the run, the Cr Mo tubes in one part of the furnace were corroded to minimum thickness. Corrosion rate had risen to about 0.020″/1000 hr. Tubes were replaced with those made of 18-8 Cr Ni.

Another case concerns the 1¼% Cr Mo wall coil on a reformer which had an established corrosion rate of about 0.007″/1000 hours over a long period. Whereas indicated remaining life of tubes was six



Corroded riveted joint from a gasoline tank

years, it was found that corrosion rate had jumped to 0.025″/1000 hours. The excessive corrosion was due to a cocked and poorly adjusted burner which caused localized heating.

Other similar cases cover hydrogen sulfide and naphthenic acid corrosion, as well as effects of the addition of sulfuric and hydrofluoric acids during processing.

One type of corrosion that causes considerable difficulty is the slow, seemingly harmless variety such as that of large gasoline storage tanks. Highest rate occurs where shell is exposed about 75% of the time. Corrosion rate for shipping tanks is about twice that of base stock tanks due to the more frequent changes in level of the liquid in the former.

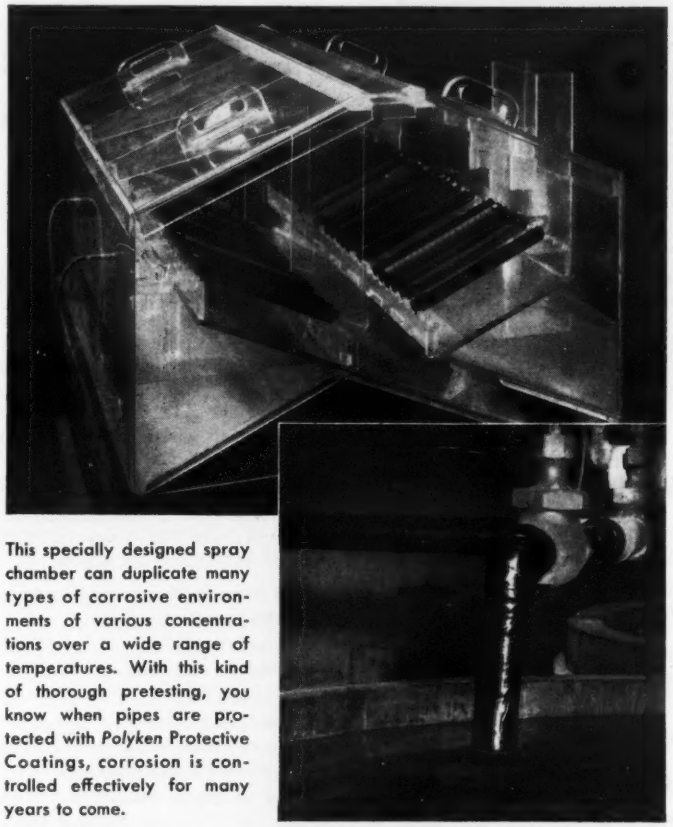
Accompanying illustration shows a typical corroded riveted joint from a gasoline tank. Greatest loss in thickness occurs adjacent to the rivets but under the rivet heads the plate remains the original thickness.

(*Continued on next page*)

Preview of Pipe "Years from Now"... Shows

long-range protection

by Polyken protective coatings



This specially designed spray chamber can duplicate many types of corrosive environments of various concentrations over a wide range of temperatures. With this kind of thorough pretesting, you know when pipes are protected with *Polyken* Protective Coatings, corrosion is controlled effectively for many years to come.

This spray chamber in the *Polyken* laboratory speeds up corrosion action so you can see—in a matter of weeks—how a field application of *Polyken* Protective Coating fights corrosion through the years.

Take the new *Polyken* Protective Tape Coating as an example. Extensive field and laboratory tests, including the spray chamber, showed that this tape would safeguard piping from contact with acid fumes and spray. The actual application, shown in the lower photograph, confirmed the tests. That's corrosion protection . . . previewed and proved.

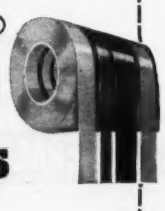
Actually a single wrap of this new *Polyken* Protective Tape Coating is a bond of two anti-corrosion barriers—each one highly effective in itself. Next to the pipe is a specially developed synthetic adhesive that provides protection over a wide range of temperatures and conditions. Because this adhesive is unusually thick, all surface voids, pits and pores of the pipe are filled in.

A new process bonds this 4 mil adhesive to an 8 mil polyethylene film, forming the second corrosion barrier that has all the well-known protection polyethylene provides.

This new *Polyken* Protective Tape Coating is available now in two colors: No. 900, black and No. 910, gray. Test samples and further information are ready for you.

TAILORED TO YOUR JOB

Polyken®



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Department of Bauer & Black
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222 West Adams St., Chicago 6, Illinois

Please send me samples and further information on *POLYKEN* PROTECTIVE TAPE COATINGS.

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EVERYTHING YOU NEED...

OR MAY NEED... in a corrosion-proof cement

LOOKING beyond present needs, your unforeseen or future requirements are fulfilled by Atlas ALKOR® 5E. This one furane resin cement resists acids, alkalies, salts, greases, solvents and oils at temperatures to 380° F. . . . providing a range of protection you should have against unforeseen factors or eventual process changes.

And, you have long-term protection with ALKOR 5E. By every accepted test, ALKOR 5E has proved superior in both physical and chemical properties . . . as well as in important considerations of use. ALKOR 5E is safe to install. *It will not contribute to skin disorders . . . and has no objectionable odor.*

ALKOR 5E HAS NO EQUAL

ONLY ALKOR 5E combines *low shrinkage* that means level joints . . . *high adhesion* to brick of over 700 psi . . . *long working time* that cuts material waste . . . *fast setting time* for practical use . . . with *virtually universal resistance* to corrosion.

FOR COMPLETE FACTS, send for Bulletin 5-2.

ATLAS MINERAL MERTZTOWN PENNSYLVANIA

ATLAS PRODUCTS STAND
...between your process and corrosion

Engineering Representatives Throughout the United States

When inquiring check CP 1808 on handy form, pgs. 2-3

(*Continued from preceding page*)

Additional thickness next to the rivet holes adds to the net section and materially increases the joint strength in tension. Note that the joint has been poorly caulked and a groove has been formed in the plate. Although groove is away from the weakest part of the joint, it still can be a factor because of the notch effect.

(Technical paper, "Inspection of Petroleum Refinery Equipment," by Edward H. Tandy, Standard Oil Co. of California, Dept. CP, El Segundo, Calif., was presented at the recent National Association of Corrosion Engineers Conference in Chicago.)

ASTM survey indicates wide interest in ceramic coatings in relation to engineering design . . .

almost unprecedented reply suggests more than 150 different areas of application

The almost unprecedented high percentage of reply to a recent ASTM survey on porcelain enamels and ceramic coatings as engineering materials indicates the wide interest in the subject. The survey was directed to seven hundred agencies representing research and development, and widely diversified industries. More than 150 topics of general and particular interest were suggested, in addition to the ten covered by the American Society for Testing Materials survey committee.

These ten areas mentioned by the committee concerned the relation of ceramic coatings to chemicals, abrasion, high temperature corrosion, physical and thermal shock, and the use of the coatings on nonferrous metals. All received strong and somewhat diversified support. The greatest interest was shown in resistance to high temperature corrosion.

Some of the other 150 additional topics of interest to the recipients of the survey are as fololws. This list contains only those considered the most significant.

1—Resistance of ceramic coatings to:
- a—hot specific chemicals
- b—molten metals such as lead, zinc, and aluminum
- c—high velocity gases
- d—vibration
- e—gas penetration
- f—long heating in particular atmospheres
- g—electron bombardment

2—Use of ceramic coatings:
- a—in fluid conduits to reduce friction
- b—in bearings for high temperature use
- c—in sewage and water treatment
- d—on structural steel, bridgework, and building components
- e—for thermal insulation and reflection of radiant energy

(Information was obtained from technical paper, "Porcelain Enamels and Ceramic Coatings, Prime Inhibitors of Metal Corrosion," by Dwight G. Bennett, Research Professor of Ceramic Engineering, Dept. CP, University of Illinois. This paper was presented at the recent National Association of Corrosion Engineers Conference in Chicago.)

TRIANGLE

Plastic PIPE

HIGH CHEMICAL RESISTANCE!
EXTREMELY LIGHT!
EASY TO HANDLE!
GREATER FLOW!

Here is the best possible pipe for conveying chemicals and corrosive wastes.
Available in four types one or more of which can help solve problems for *you*.

FLEXIBLE—Polyethylene, sizes ½" to 6". Won't rot, rust or corrode. Light weight, good flexibility. Smooth interior walls allow 18% greater rate of flow. Up to 3" available in coils.

SEMI-RIGID—Butyrate. Sizes ½" to 6". Light, easy to handle. Chemically inert. Smooth walls mean greater flow. Twenty foot lengths.

RIGID HIGH IMPACT—Light, rigid yet can take high impact. Extremely resistant to salt, bleaches, chlorine gases, sulfuric acids. Can be offset, bent and welded. Ten foot lengths.

RIGID P.V.C.—Polyvinyl chloride. Hard, tough, rigid. Excellent abrasion resistance, high insulating value. Outstanding resistance to organic and inorganic acids, alkalies and alcohol. Ten foot lengths.

Write for new booklet.

PLASTIC PRODUCTS Division
TRIANGLE CONDUIT & CABLE CO., INC.
New Brunswick, New Jersey
It Must Be Right

When inquiring check CP 1809 on handy form, pgs. 2-3

THE "SEWER MASTER"

OSTER pipe and bolt threading machines have helped maintenance men keep the lid on threading costs for sixty years. Now the new "Sewer Master" is ready to help cut sewer cleaning costs.

The Oster "Sewer Master" is a light, low-cost machine that weighs less than 100 lbs. It clears obstructions 100 ft. or more from the sewer entrance. A snap switch reverses its powerful motor so the "snake" can be revolved in either direction assuring easiest removal of toughest obstructions. Large rubber tired wheels make the "Sewer Master" easy to move up and down stairs and to the job. And the price is right.

The "snake" is securely held and revolved by the "Sewer Master" at any convenient distance from the sewer entrance by revolving chuck jaws. Complete control of its action is maintained through a convenient control lever. Cutting tools to remove roots, grease, chips, and many other obstructions are easily attached to the "snake".

For a free, fully illustrated booklet that gives complete facts about the new Oster "Sewer Master" fill in the coupon below and mail it to us. We will send your copy by return mail.

THE OSTER MANUFACTURING COMPANY
2032 East 61st Street • Cleveland 3, Ohio
Send me full facts about the New Oster "Sewer Master".
Name_____
Company_____
Address_____

FACTS about the OSTER "SEWER MASTER"

1893 - CELEBRATING 60 Years Leadership in the Threading Industry - 1953

When inquiring check CP 1810 on handy form, pgs. 2-3

Titanium resists corrosion in galvanic tests run in NaCl solution . . .

does not corrode when coupled to other metals

Recent experiments conducted by the Bureau of Mines showed that titanium did not corrode when coupled with magnesium, zinc, aluminum, iron, or stainless steel in a three per cent sodium chloride solution — approximately the same amount found in sea water. All the other metals except stainless steel did corrode, however.

Titanium corroded when joined to copper in sealed bottles containing various concentrations of hydrochloric acid aerated by helium. When air was substituted for the helium, though, the copper corroded and titanium was not affected. Adding amounts of dissolved copper to the solution made titanium even more corrosion-resistant, according to the report.

(Results of the experiments are given in report, "Certain Aspects of the Galvanic Behavior of Titanium," April 17, 1953, P.N. 39525. It can be obtained without charge from the Bureau of Mines, Publication Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.)

Insulating pipe flanges prevents corrosion

Protection against electrolytic corrosion by use of company's insulation for pipe line flanges is described in six-page bulletin. Material, known as Tuffite, is a phenolic condensate compounded with a mascerated canvas. Kits of product are available from manufacturer for piping applications.

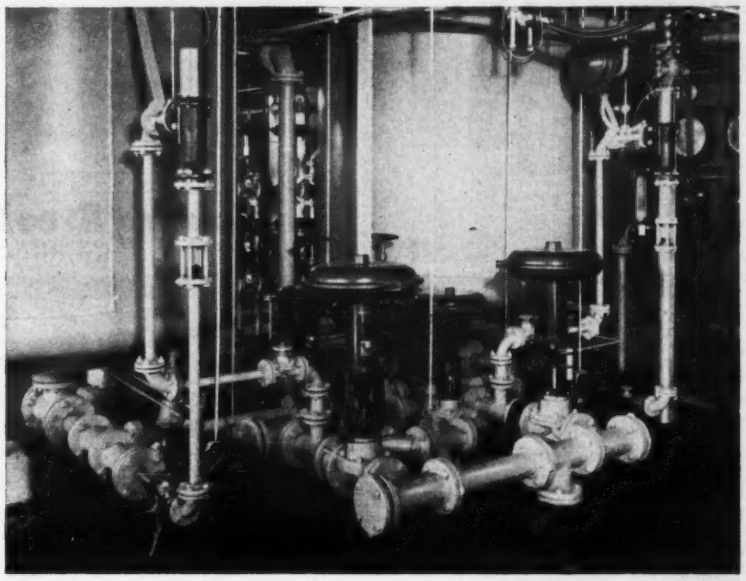
Material is said to have high insulation qualities and great mechanical strength. When fabricated it is vapor-proof, dust-proof, waterproof, oil-proof, acid-proof, alkaliproof, shock-proof, chip-proof, and heat resistant up to 250°F. Bolt bushings and spacer gaskets of material in a variety of sizes are shown. Insulators, known as Electro-Stops, for pumps, meters, cycling stations, and other applications are also discussed.

Bul, Tuffite Kits, is issued by Stewart R. Browne Mfg. Co., Inc., Dept. CP, 258 Broadway, New York 7, N. Y. When inquiring specify CP 1810A, pgs. 2 & 3.

DOW

CORROSIVE LIQUIDS CAN'T HURT THIS INSTALLATION

Large midwest corn processor installs SARAN lined pipe, fittings and valves



When one of the largest processors of corn in the midwest was faced with the problem of handling corrosive liquid safely and efficiently in an ion exchange system, they investigated saran lined pipe and fittings.

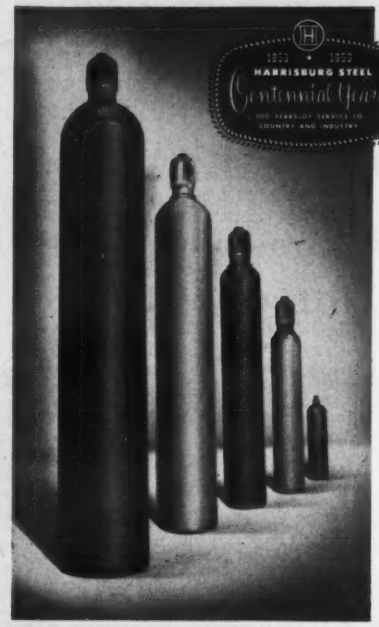
They learned that saran lined pipe fittings and valves assure tight, leakproof joints. They were convinced that the excellent corrosion resistance of strong, rigid saran lined pipe would mean longer service and greater dependability. The sum total of advantages offered by saran lined pipe indicated that it would meet the company's demands for equipment that would assure uninterrupted processing free from the expense and inconvenience of unscheduled "shutdowns." Wherever piping with unusual resistance to most chemicals and solvents is involved, install saran lined steel pipe. It can be easily cut and threaded in the field without need for special tools or handling; costly downtime can be reduced to a minimum. We'll be glad to assist you with installation plans. Write or call the Saran Lined Pipe Company, Ferndale, Michigan. Offices in New York • Boston • Pittsburgh Tulsa • Philadelphia • Chicago • Portland • Indianapolis • San Francisco Houston • Denver • Los Angeles • Seattle Cleveland • Charleston, S. C. • Toronto Montreal. Saran lined pipe is a product of THE DOW CHEMICAL COMPANY.

Saran Lined Pipe Company
2415 Burdette Ave., Ferndale, Mich.
Please send me a copy of your catalog on Saran Lined Pipe, Valves and Fittings.
Name_____
Title_____
Company_____
Address_____
City_____ State_____

RELATED SARAN PRODUCTS
Saran rubber tank lining • Saran rubber molding stock • Saran pipe and fittings Saran tubing and fittings

you can depend on DOW PLASTICS DOW

When inquiring check CP 1811 on handy form, pgs. 2-3



Buy with CONFIDENCE!

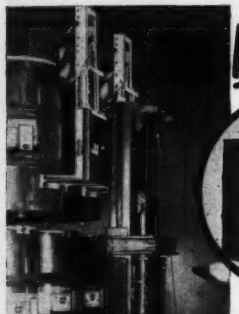
Yes, buy with confidence when you need cylinders for the storage or transportation of fixed, liquid, and medical gases in your plant... and buy from *Harrisburg Steel*, pioneer and world's largest manufacturer of seamless steel high-pressure gas cylinders made to I.C.C. Specifications.

Harrisburg Steel offers you the choice of a complete line, a complete range of sizes and capacities, in both domestic and export types... from 14 to 400 cubic feet. Orders from a few dozen to several thousand cylinders all receive prompt attention. *Write for our Cylinder Catalog and current prices.*

100 Years in Pennsylvania's Capital
Harrisburg Steel CORPORATION HARRISBURG 24 PENNSYLVANIA

HARRISBURG CYLINDERS
FOR HIGH-PRESSURE GASES

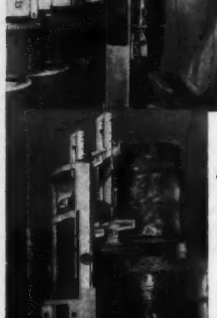
When inquiring check CP 1812 on handy form, pgs. 2-3



NOW moves 32 drums an hour with ONE MAN!*

Formerly 16 Drums an hour with overhead crane and 2 men....

THE LIFT-O-MATIC POWER TRUCK ATTACHMENT **for DRUM HANDLING**



- **Simple** ... One operator can attach or remove unit, WITHOUT TOOLS, in only 2 minutes.
- **Automatic** ... Raising or lowering truck carriage provides automatic, mechanical pick-up and release. Additional operator controls unnecessary.
- **No Pallets Needed** ... Move, tier or place drums quickly without pallets.
- **FITS ANY TRUCK**

* Case history on request

Write for Details **MARVEL INDUSTRIES, Inc.** 2234 CLEVELAND ST., EVANSTON, ILLINOIS

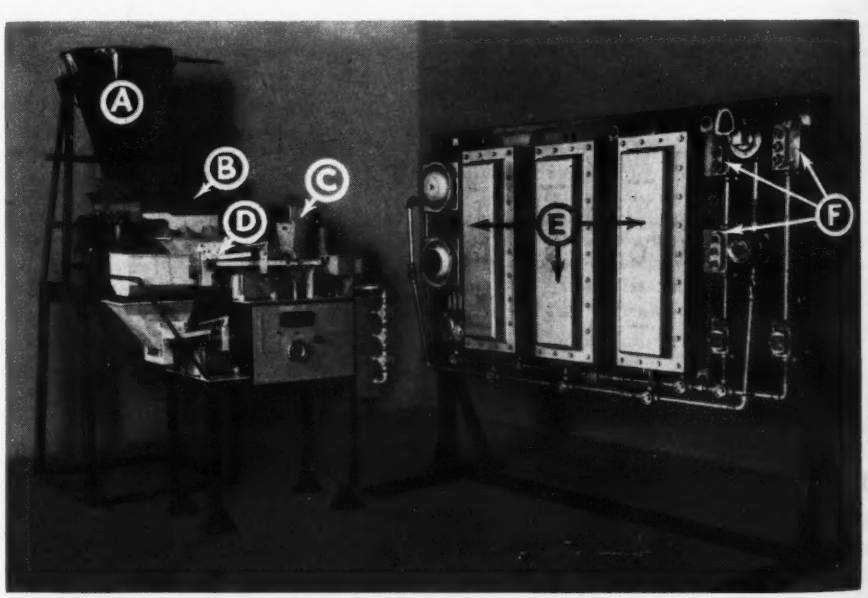
When inquiring check CP 1813 on handy form, pgs. 2-3

4-5 gram tolerance in 9-lb powder batches is kept accurate and checkweighed four times each minute

Machine's circuits are kept in explosion-proof housing, and operate it manually, semi- or completely automatically

EXTREME accuracy in weighing is of utmost importance at an eastern plant producing vital material for the government. The material, although handled in small batches, must also be kept moving at a reasonably fast speed and at the same time accuracy must be maintained — 9 lb per weighment, four weighments per min, and to an accuracy of 4 to 5 grams.

The checkweighing machine (Model XA-430) used for this purpose has a maximum capacity of 12 lb per weighment.



Principal components of the checkweighing machine as designated in the photo: A) hopper, B) feeder trough with vibrator, C) No. 1 Weigh scale bucket, D) No. 2 Checkweigh scale and bucket, E) Explosion-proof cases containing electric units, and F) Control buttons. Tolerance is automatically kept within 4-5 grams four times each minute as 9-lb quantities are filled and weighed. Checkweighing can also be done semi-automatically or manually

The unit consists of supply hopper, vibratory feeder, troughs, a weighing scale and bucket, a checkweighing scale, and necessary electronic circuits, which are enclosed in explosion-proof housing. (See photo)

The double scale arrangement provides for the initial weighing and checkweighing operations within one machine, since in this particular case all weighments must be made twice, as required by government specifications.

The feeder consists of two separate vibratory feeders. A large feeder is provided for fast feed (bulk fill) and a small V trough feeder provides the trim material. The small trimming feeder is designed to deliver 1 lb at a time to the weigh scale bucket, and in this manner, extremely close accuracy is achieved.

Both the No. 1 and the No. 2 scales (See photo) are set for a pre-determined weight and the vibratory feeder discharges material into the top (No. 1) scale weigh bucket. Upon completion of the weighing operation in the top (No. 1) scale, the (No. 1) weigh scale bucket rises from the weigh scale lever and dumps its contents into the weigh scale (No. 2) bucket directly below. The lower (No. 2) checkweigh scale then automatically checks the batch of material and indicates whether this batch is "in" or "out" of tolerance.

The indication of "in" or "out" of tolerance loads is given by classification lights. If the batch is "in" tolerance, the check weigh scale (No. 2) rises from the check lever and automatically discharges its contents into the waiting receptacle or container.

Checkweighing machine can be operated by three different methods: 1) the entire cycle can be operated manually by pushbuttons, 2) the unit can be operated semi-automatically, and 3) the operation can be completely automatic, as described above.

(Checkweighing machine specially designed for use at the plant is a product of The Exact Weight Scale Co., Dept. CP, 944 W. Fifth Ave., Columbus 8, Ohio . . . check CP 1813A, pages 2 and 3.)

No spill, no splash occurs when tilter is used for pouring

Uses: For pouring of liquids from 5 and 6½ gal containers.

Features: Accidents caused by spilling, splashing and carelessness are prevented, since pouring spout assures a smooth flow without spurts or splashes.

Description: Tilter No. 49 is made of acid-resistant rubber and plastic tubing. Unit fits openings from 1 to 1⅜", with a flow capacity of slightly more than 1 gpm. Unit comes complete with pouring spout.

(Development of The General Scientific Equipment Co., Dept. CP, 2700 W. Huntingdon St., Philadelphia 32, Pa. . . . or for more information check CP 1813B on handy form, pages 2 and 3.)

MODEL F-38T
2000 lbs. Capacity

...use in narrow aisles and congested areas?

...jobs where driver gets on and off frequently?

...fast handling at all times?

...loading road trucks and freight cars!

If your answer is "YES" to any question, look at these plus features of the

NEW ELWELL-PARKER "Cargo Scout"

ELECTRIC OPERATION—means power costs are only pennies per day. No vulnerable clutch and reciprocating parts to wear out. No battle with exhaust fumes. Noiseless operation does not interfere with inter-com systems.

UNIT ASSEMBLY—cuts repair time. All parts instantly accessible for lubrication or repairs. Major assemblies are completely independent, permitting swift removal for bench repair.

END CONTROL—fast, easy and safe for operators who must get off the truck frequently. Stand-up operation keeps the driver alert, provides better vision.

CONTACTOR CONTROL—insures fast, smooth starts and instant response to operator's demands. Just one handle controls speed and direction. Contactor controls are easier to maintain.

360° STEERING—plus a short, 57" turning radius for close-quarters operation. Truck trailer and box car loading is faster. Small size elevators no longer a problem. Special device completely eliminates steering wheel kick-back.

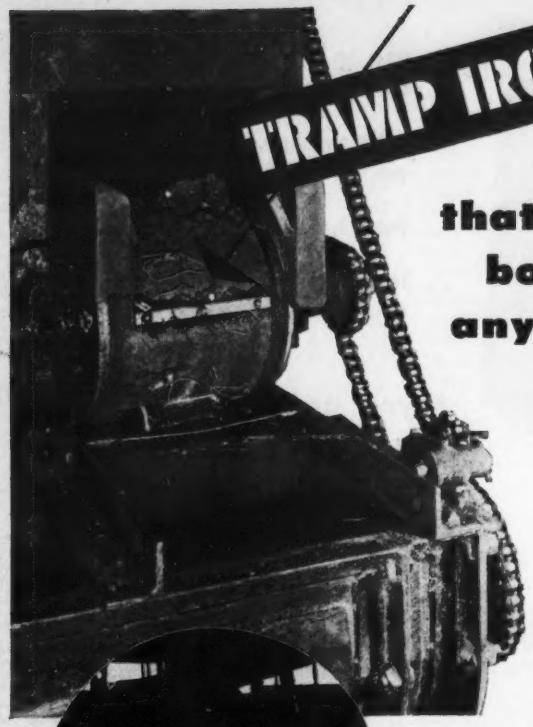
TELESCOPING UPRIGHTS—permit use of all available storage area. 100" of lift with only 68" overall height with uprights retracted and a full 50" of free lift.

GET ALL THE FACTS; *write The Elwell-Parker Electric Co., 4016 St. Clair Avenue, Cleveland 3, Ohio.*

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS
Established 1893

"Cargo-Scout" = famous E-P dependability plus Remarkable Maneuverability

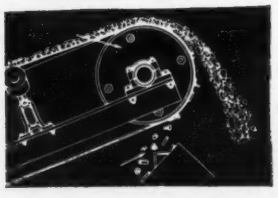
When inquiring check CP 1814 on handy form, pgs. 2-3



that won't bother anybody!

Renderer keeps iron out of screw press with DINGS Perma-Pulley

LOOK AT THE IRON in that collection tray — plenty of trouble for a continuous screw press . . . trouble that's not going to happen because the operators have installed a Dings Magnetic Pulley on the belt conveyor that feeds the press.



THIS powerful, non-electric Dings Perma-Pulley pulls wire, tin, nuts and bolts out of the material being processed. The magnetic pulley holds this material on the belt until, out of magnetic range, it drops harmlessly in the collection tray.

Your tramp iron problem may or may not have such a simple solution, but whatever, wherever it is there's a Dings Magnetic Separator that will do the job.

Dings RM Rectangular Suspended Magnets

Dings Non-Electric Magnetic Drums

Dings High-Intensity Separators

Write **DINGS MAGNETIC SEPARATOR CO.**
4731 W. Electric Ave., Milwaukee 46, Wisconsin
for free CATALOG C-5000-B.

PPU-253

DINGS Magnets

When inquiring check CP 1815 on handy form, pgs. 2-3

Trucks on dragline conveyor won't weave while carrying loads in warehouse . . .

pushbar on superstructure allows manual use when unit is off the line

Uses: For use with dragline conveyor systems.

Features: "Weaving" of the trucks while moving along the conveyor route is prevented with use of caster alignment and hanger mounting of main wheels to assure a steady course. Pushbar on truck superstructure allows manual handling when truck is not attached to the conveyor.

Description: Dragline conveyor trucks are made with one-piece, arc-welded steel frame and without bolts or rivets. The "A" frame design consisting of

Trucks stay on a steady course

two diagonal channels, two "V" type hangers, and a tubular housing for the axle, and the inside wheel washers are designed for special rigidity against shocks and abuse. The "A" frame design also permits the main wheels to be mounted closer to the sides of the truck, thereby providing better stability for the load.

(Development of Dept. R-5, Lewis-Shepard, Dept. CP, Watertown, Mass. . . . or for more information check CP 1816 on handy form, pages 2 and 3.)

Storage space requirements cut by 40 per cent at brewery — one truck did it . . .

palletization replaces hand labor, cartons can now be stored 23 high instead of 10

A 40 per cent saving in storage space has been realized by the Standard Brewing Company at its

for **PUMPING CHEMICAL SOLUTIONS!**

NO LEAKAGE at STUFFING BOX

Fig. 19,488

VERTICAL DESIGN

Taber vertical pumps are specially built for handling chemical solutions, efficiently and economically . . . in the processing industries. Vertical design permits locating stuffing box above and out of liquid level. Therefore nothing to leak.

On business stationery, we suggest you write for:

BULLETIN V-837

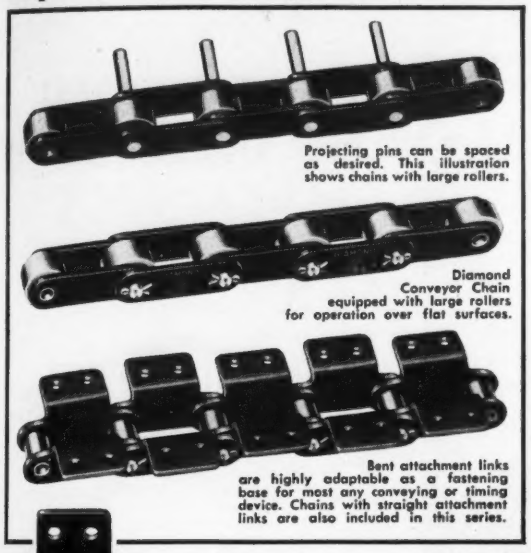
TABER PUMP CO. *Est.* 1859
320 ELM ST., BUFFALO 3, N.Y.

When inquiring check CP 1817 on handy form, pgs. 2-3

DIAMOND

CONVEYOR CHAINS

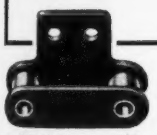
Improve Machinery Performance



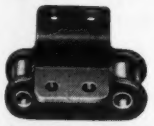
Projecting pins can be spaced as desired. This illustration shows chains with large rollers.

Diamond Conveyor Chain equipped with large rollers for operation over flat surfaces.

Bent attachment links are highly adaptable as a fastening base for most any conveying or timing device. Chains with straight attachment links are also included in this series.



Roller Link with straight Attachment Link Plate on one side. Also furnished with plates both sides.



Roller Links can be supplied with bent plate on one side or both sides.

Similar to above but chain has large Rollers to roll on flat surfaces.

● Diamond Conveyor Chains are manufactured to the same high standards as Diamond Roller Chains. Uniformity of quality — high tensile strengths — and the wear-resisting properties of the hardened pin bushings and rollers result in longer-life performance, and steady maximum output.

A wide selection of pitches, chain designs, and attachments are available for materials handling operations — packaging, boxing, labeling, wrapping — and for timing and control mechanisms.

Conveyor Chains & Sprocket Bulletin 29, gives complete information, illustrations and useful data. Copy will be mailed on request.

DIAMOND CHAIN COMPANY, Inc.

Dept. 411, 402 Kentucky Avenue, Indianapolis 7, Indiana

Offices and Distributors in All Principal Cities

Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

BETTER CHAINS MAKE BETTER MACHINES

DIAMOND ROLLER CHAINS

When inquiring check CP 1818 on handy form, pgs. 2-3

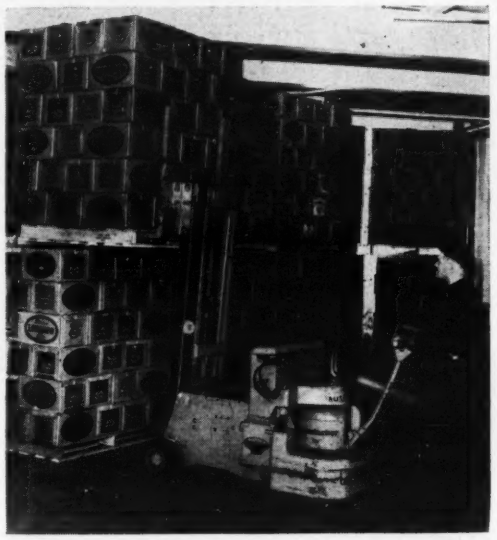
Cleveland, Ohio plant since its switchover from hand labor of stacking to a combination which uses a single industrial truck and an efficient program for palletizing the loads.

Although most of the materials handling in the three-story building is done by conveyor, it was only a little more than two years ago that the firm instituted palletization of bottle cartons on its top floor having a storage area of 32,000 square feet.

Prior to the new system, by using hand labor cartons could be stored only 10 high. With the new set up, bottle cases are now loaded 72 to a pallet and are stored 23 cases high.

Feat is accomplished with a driver-led, electric-powered Transtacker truck which feeds pallet's loads of bottles to conveyors leading down from the third floor. The powered unit is also used in handling and moving of caustic soda drums and cases of bottle crowns and can lids.

The 400-lb drums, stored on the third floor until needed, are loaded four to a pallet and stacked three



Palletization and truck increased storage space by forty per cent

pallets high in one corner of the area. Bottle crowns and can lids, because of the danger of damage, are stored only one pallet high and with 50 boxes to the pallet.

The truck is also used for transporting incoming bottles and raw materials from the company's truck dock and rail siding to the third floor. Truck loading of the finished product is accomplished by conveyors which lead directly from the lines where the brew is processed.

(Transtacker units used at the brewery are manufactured by the Automatic Transportation Company, Dept. CP, 149 W. 87th St., Chicago 20, Ill. . . . or reader may secure more information by checking CP 1819 on convenient Reader Service slip between pages two and three.)

CONSULT P-S FOR THE BEST *Materials* HANDLING EQUIPMENT

Item C-465 $30.25

Vertical DRUM LIFTER

For handling open and closed steel drums in vertical position, by crane or hoist. All-steel, with heavily welded chain. Sure-hold safety barrel grip. Saves plant space. Use for either high or low ceiling condition.

CARBOY TRUCK

BARREL CRADLE

All metal PALLET

DRUM and BARREL TILT

Item B-731 $181.50

A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive.

Equipped with two safety type locking devices and all-steel, welded yoke. Hand-operated chain drive.

MULTI-PURPOSE CART

Combination TRUCK and DRAIN RACK

Loads Automatically

Moves barrels or drums, also serves as drain rack. Two styles—with or without detachable handles. Sturdy frame-welded construction. Weight approximately 90 lbs.

Item NS-506 (Handles welded to frame) $46.75

Item NS-506 DH (Detachable handles) $48.95

TRAILER TRUCK side dump

CORRUGATED BOX with legs

Corrugated STEEL PLATFORM

Industrial DUST PAN

Item B-470 from $24.20

BARREL and BOX SKID All-Steel

This new skid, although much lighter in weight and easier to handle than the old fashioned, clumsy wood skids, is made entirely of steel, welded construction and will out-last any wooden skid that was ever made. Will stand up under the heaviest barrel or box. Skid measures 14" wide overall. Attractively priced.

BARREL TRUCK loads automatically

WHEN ORDERING always give "Item" number. All PRICES are f.o.b. Detroit. Prices are subject to change without notice.

Write for

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16016 FULLERTON AVE., DETROIT 27, MICH.

When inquiring check CP 1820 on handy form, pgs. 2-3

PITTSBURGH COKE & CHEMICAL Reports:

ERIEZ DRUM PULLS IRON FROM SLAG AND IT'S WORTH $40 A TON TO US!

ERIEZ Permanent Magnetic Drum removes 3 tons of iron daily!

"It's like finding gold . . ." says L. R. Forbrich, Cement Plant Superintendent of the Pittsburgh Coke & Chemical Company. Installed on a granulated slag drier, an Eriez Permanent Magnetic Drum has been working 24 hours a day . . . separating an average of 3 tons of scrap metal profits each week from granulated slag! The slag is used in the manufacture of the company's Green Bag Portland-Pozzolan Cement. "The Eriez Drum not only maintains our product's quality, but it reclaims valuable metal. This metal, as scrap iron, is worth about $40 a ton to us on today's market. The drum has paid for itself many times over."

Installed at the discharge of an open or closed chute, spout or screw conveyor, etc., the Eriez Magnetic Drum and Housing automatically, simply and economically removes tramp iron from chemicals.

Only the ERIEZ line of Drums has All These Features:

1. Stainless steel shell resists corrosion and abrasion.
2. Dust-tight construction standard at no extra cost.
3. Rigid, lightweight, compact, cast aluminum sides.
4. Sheave size easily changed for various operating speeds.

Write for new, FREE 6-page Drum Bulletin which describes all separator installations for the chemical industry.

ERIEZ MANUFACTURING COMPANY

13 Magnet Drive • Erie, Pennsylvania

"Buy permanent protection . . . by ERIEZ"

When inquiring check CP 1821 on handy form, pgs. 2-3

Mud, snow, rough terrain are "home" to low-gravity-point loader with high traction . . .

tilting tower feature and ten handling attachments cope with varied requirements

Uses: For materials handling work in mud, snow, and rough terrain.

Features: Tilting tower (both forward and back) gives increased efficiency in loading and unloading, dumping and digging, and for handling capacity loads without spillage. Unit has low center of gravity, high traction tires, and ten handling attachments are available for servicing wide range of industrial requirements.

Description: Universal Loader is available in three models (2500, 4000, and 6000 lb capacities) and mounts on Case, Minneapolis-Moline, Shepherd, and Oliver industrial tractors.

Double-acting hydraulic cylinders tilt the tower 20° forward and 9° to the rear of center. Lifting

Goes over hill, dale, through mud and snow

heights of largest model is 100"; higher lifts are optional. Location of all actuating parts ahead of the cab ensures operational safety. Structural design permits clear vision ahead.

Loader is sold with the following attachments: adjustable lifting forks, coal bucket, snow bucket, material bucket, bulldozer blade, reversible angle-dozer blade, crane lifting hook, V-type snow plow, lifting platform, and gas-powered sweeper.

(Development of Dept KP, Baker-Lull Mfg. Co., Dept. CP, 314 West 9th St., Minneapolis 20, Minn. . . . or for more information check CP 1822 on handy form, pages 2 and 3.)

Production of paper sheeting gets a lift in handling from basement . . .

pushbutton-operated table with 2 hp has 3-ton capacity, travels 78" vertically

Increased production of a ground-floor paper sheeting machine is made possible by one firm which has

for **SUBMERGED OILLESS BEARINGS**

SPECIFY GRAPHALLOY TRADE MARK REG. U. S. PAT. OFF. WITH CONFIDENCE

- OPERATE *DRY* or *SUBMERGED* IN DYES, PLATING, CLEANING & CHEMICAL SOLUTIONS, GASOLINE, FOODSTUFFS
- TRULY OILLESS AND SELF-LUBRICATING
- EXTREMELY DURABLE
- CONSTANT COEFFICIENT OF FRICTION
- APPLICABLE OVER A WIDE TEMPERATURE RANGE—even where oil solidifies or carbonizes
- EXTENSIVELY USED IN CONVEYORS, PUMPS & OVENS
- ROTATING SEALS OF GRAPHALLOY ARE UNEXCELLED

GRAPHITE METALLIZING CORPORATION

1004 NEPPERHAN AVENUE • YONKERS, NEW YORK

Please send data on Graphalloy SUBMERGED OILLESS BEARINGS.

NAME & TITLE

COMPANY

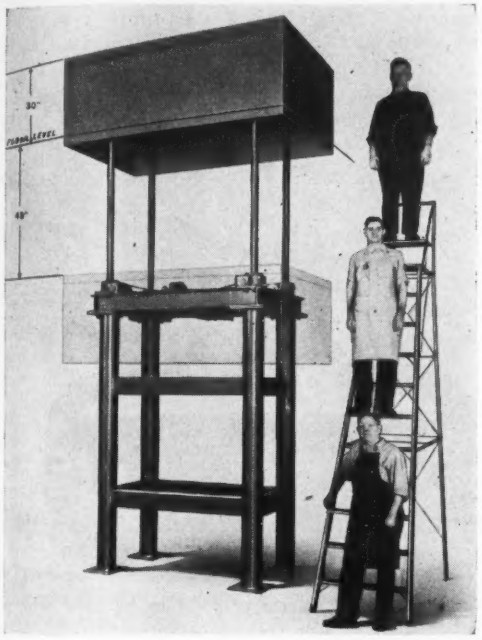
STREET

CITY ZONE STATE

When inquiring check CP 1823 on handy form, pgs. 2-3

provided a quick, simple means of handling 6′ stacks of sheeted paper at the delivery end of the machine.

A lifting device, called the Portelvator, capable of handling 3-ton loads, has been installed in the basement. In operation, a skid is positioned on the



2-hp motor powers platform to raise 3-ton load 78"

84 x 48″ platform and the platform is raised to maximum height of 30″ above floor level. As sheets are received on the skids, the platform is lowered until it reaches its extreme low position, in this case, 48″ below floor level, and then returned to floor level where a fork truck removes the stack to storage. Operated by a 2 hp motor, with reversible magnetic starter, limit switch, and overload position, the table is pushbutton-operated for a total vertical travel of 78 inches.

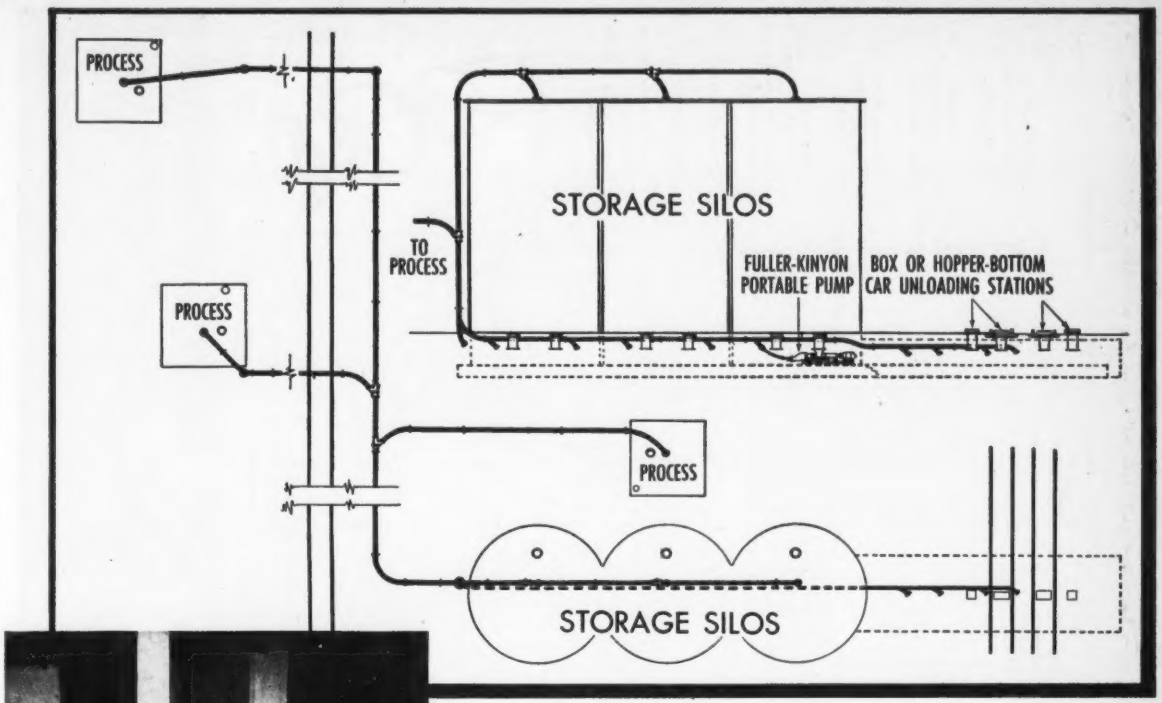
(The Portelvator is a product of The Hamilton Tool Company, Dept. CP, Hamilton, Ohio.)

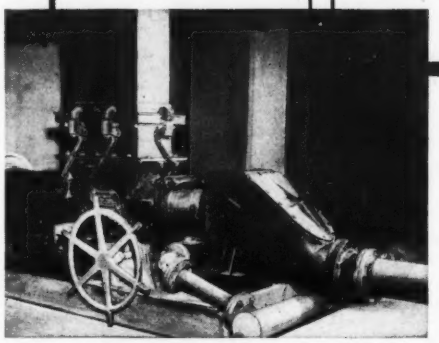
Buyer's guide for roller chains and sprockets

This 54-page bulletin is designed for those who buy, select, and maintain roller chain and allied equipment. Inherent advantages of roller chains are discussed and several are illustrated.

A section of the bulletin is a treatise on "how to select standard roller chain drives" — with formulas, tables, and examples illustrating procedure. Roller chain dimensions, strengths, weights, and prices are included.

Bul 52-1 is issued by Dept. P.R., Baldwin-Duckworth, Div. of Chain Belt Co., Dept. CP, Springfield 2, Mass. When inquiring specify CP 1824 on handy form, pages 2 and 3.





speed and economy assured with **Fuller-Kinyon**

Deep in the heart of Texas, this Fuller-Kinyon Conveying System is at work handling bulk shipments of pulverized phosphate rock from cars to storage, for a prominent chemical company.

This same portable Fuller-Kinyon Pump, in addition to unloading from box or hopper-bottom cars, on adjacent tracks, and delivering to any one of three storage silos, can be moved on a track to positions underneath these silos. Connection is easily and quickly made to the silo to be emptied and material conveyed to any one of three widely separated process points in the plant. Advance designing makes this dual use of the Fuller-Kinyon Pump feasible.

Conveying is done at the rate of 50 tons an hour, with the longest conveying distance approximately 690 feet; together with branch lines making a total of about 1070 feet.

A Fuller Rotary Single-stage Compressor furnishes the necessary air to the Fuller-Kinyon Pump for conveying.

If you handle bulk shipments of dry, pulverized materials it will be worth your while to learn about Fuller air conveying systems now. Write today!

Fuller
CONVEYS BY AIR
CLEAN...SAFE...EFFICIENT

FULLER COMPANY, Catasauqua, Penna.

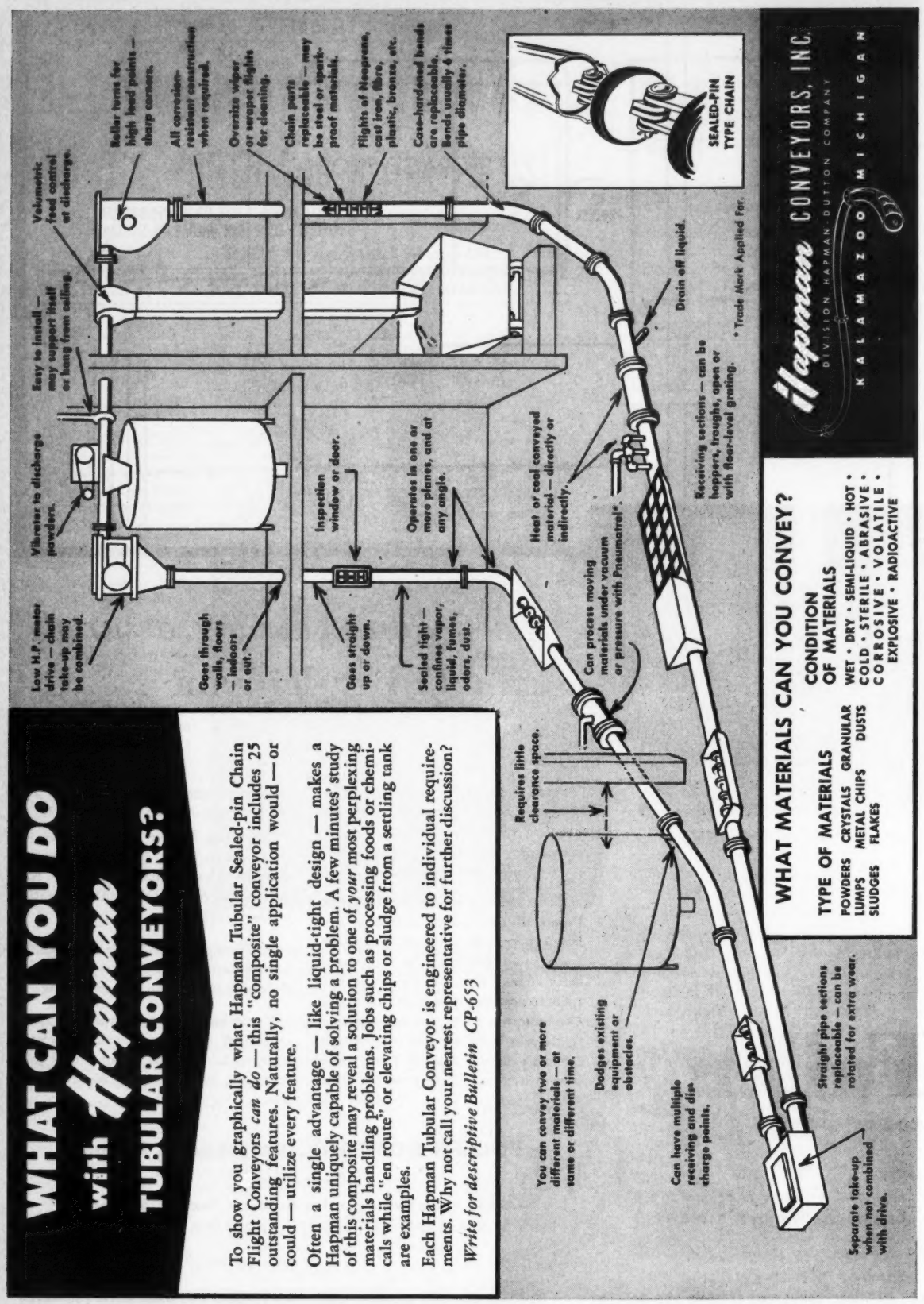
Branch Offices

Chicago • San Francisco • Los Angeles • Seattle • Birmingham

P-147
1844

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS • • • COMPRESSORS AND VACUUM PUMPS • • • FEEDERS AND ASSOCIATED EQUIPMENT

When inquiring check CP 1825 on handy form, pgs. 2-3


WHAT CAN YOU DO with Hapman TUBULAR CONVEYORS?
To show you graphically what Hapman Tubular Sealed-pin Chain Flight Conveyors can do — this "composite" conveyor includes 25 outstanding features. Naturally, no single application would — or could — utilize every feature.
Often a single advantage — like liquid-tight design — makes a Hapman uniquely capable of solving a problem. A few minutes' study of this composite may reveal a solution to one of your most perplexing materials handling problems. Jobs such as processing foods or chemicals while "en route" or elevating chips or sludge from a settling tank are examples.
Each Hapman Tubular Conveyor is engineered to individual requirements. Why not call your nearest representative for further discussion?
Write for descriptive Bulletin CP-653
Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN
* Trade Mark Applied For.
WHAT MATERIALS CAN YOU CONVEY?
TYPE OF MATERIALS
POWDERS CRYSTALS GRANULAR DUSTS
LUMPS METAL CHIPS
SLUDGES FLAKES
CONDITION OF MATERIALS
WET · DRY · SEMI-LIQUID · HOT · COLD · STERILE · ABRASIVE · CORROSIVE · VOLATILE · EXPLOSIVE · RADIOACTIVE
SEALED-PIN TYPE CHAIN
Volumetric feed control at discharge.
Roller turns for high load points — sharp corners.
All corrosion-resistant construction when required.
Oversize viper or scraper flights for cleaning.
Chain parts replaceable — may be steel or spark-proof materials.
Flights of Neoprene, cast iron, fibre, plastic, bronze, etc.
Case-hardened bends are replaceable. Bends usually 6 times pipe diameter.
Easy to install — may support itself or hang from ceiling.
Vibrator to discharge powders.
Low H.P. motor drive — chain take-up may be combined.
Goes through walls, floors — indoors or out.
Inspection window or door.
Goes straight up or down.
Sealed tight — confines vapor, liquid, fumes, odors, dust.
Operates in one or more planes, and at any angle.
Heat or cool conveyed material — directly or indirectly.
Can process moving materials under vacuum or pressure with Pneumatrol*.
Drain off liquid.
Receiving sections — can be hoppers, troughs, open or with floor-level grating.
Requires little clearance space.
You can convey two or more different materials — at same or different time.
Dodges existing equipment or obstacles.
Can have multiple receiving and discharge points.
Straight pipe sections replaceable — can be rotated for extra wear.
Separate take-up when not combined with drive.

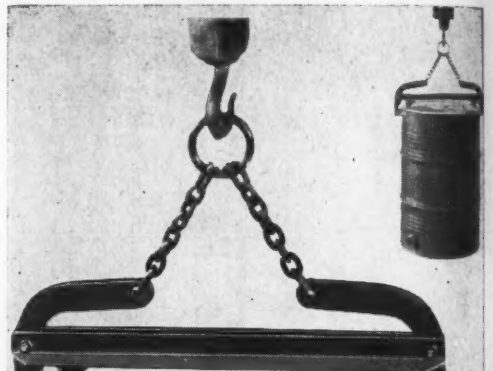
When inquiring check CP 1826 on handy form, pgs. 2-3

Open or closed drums handled with equal ease by compact, sturdy lifter . . .

unit can support 750 lb, can be used for high or low ceiling conditions

Uses: For handling of open or closed drums.

Features: Space saving is a primary feature of manufacturer's vertical drum lifter equipped with



Handles 55-gal drums weighing up to 750 lb

sure-hold safety barrel grip. Can be used where either high or low ceiling conditions exist.

Description: With maximum weight capacity of 750 lb, lifter unit weighs 30 lb, is made of all-steel construction with heavy-welded chain. Handles 55 gal drums singly.

(Development of the Palmer-Shile Co., Dept. CP, 16016 Fullerton, Detroit 27, Mich. . . . or for more information check CP 1827 on handy form, pages 2 and 3.)

Removable panels give lift truck easier accessibility for servicing . . .

gas, diesel power units have 5000-lb capacity, quick-change clutch

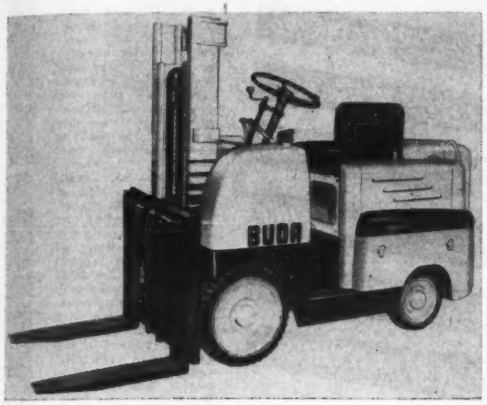
Uses: For general materials handling requiring use of 5000 lb capacity lift trucks, either gas or diesel powered.

Features: All side panels, rear and top, can be easily removed for quick accessibility to all parts. Clutch can be changed in approximately 30 min. .

Description: Models FTD50-24 and FT50-24 (diesel and gas, respectively) have 24″ load center from heel to the forks. They are available in standard heights of lift of 72, 84, 108, 114, and 120″; and are provided with 12″ diam industrial type quick-change clutch.

Other features of the trucks include: a single lever full range gear shift, center point automotive-type

steering, full front vision instrument panel, hydraulic brakes, all-roller rolled-steel mast, and self-aligning lift cylinder. Carriage is mounted on quick-adjustabe side thrust, anti-friction rollers to



In gas or diesel models

reduce wear and eliminate excessive play in the carriage. Units can be equipped with cushioned or solid rubber tires.

Overall length (less forks) is 88", with a wheelbase of 50". Truck width is 42".

(Development of The Buda Company, Dept. CP, Harvey, Ill. . . . or for more inforation check CP 1828 on handy form, pages 2 and 3.)

Frothy pulps handled by pump — without dilution

Vertical centrifugal sand pump which handles frothy pulps without dilution or continuous operating attention is described in 2-page bulletin. Important features that permit this pump to handle troublesome pulps are: feed pulp flows by gravity into pump bowl; vertical design overcomes stalling, plugging of pump, airlocking, and surging; less floor space is required; motor is mounted out of reach of water and dirt; and pump is portable.

Pumps are available in six sizes — ¾, 1, 1½, 2, 3, and 4" — providing a wide range of capacities.

Bul P10-B4 is available from Denver Equipment Co., Dept. CP, 1400 17th St., Denver, Colo. When inquiring specify CP 1829 on handy form, pages 2 and 3.

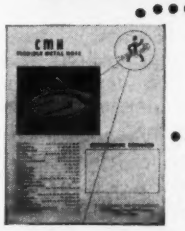
No need to search high and wide . . .

for more information on something you read in these editorial articles. A letter to the company listed at the end of the article . . . or a mark on the Reader Service slip . . . will bring you what you want. This idea originated with CHEMICAL PROCESSING many years ago to help busy men like you!

THE EDITORS

WHEREVER rigid piping must be connected to machinery

USE CMH FLEXIBLE METAL HOSE



YOUR GUIDE TO MOTION CONTROL

Catalog 130 gives specifications for all types of CMH hose. Write for a copy or see the Flexonics catalogs in Chemical Engineering Catalog and Sweets Plant Engineering File.

By using CMH Flexible Metal Hose as the connecting link between rigid pipe and machinery, you solve two otherwise serious problems—the elimination of damage to the piping because of vibration and the compensation for any misalignment that may exist. Properly installed, CMH Flexible Metal Hose will give long, dependable, trouble-free service without further attention.

Whatever your flexible connection problem, there is a CMH hose type to meet your needs. Corrugated and convoluted types are available in a wide variety of designs and in a complete range of sizes. CMH Flexible Metal Hose is offered in steel, bronze, stainless steel and other alloys to fill your requirements. Your Flexonics distributor will give you further data. Look for his name in your classified telephone directory or we will be pleased to send it to you.

CHICAGO METAL HOSE Division

Flexonics Corporation 1319 South Third Avenue, Maywood, Illinois

In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

Flexon identifies CMH products that have served industry for over 50 years.

CMH

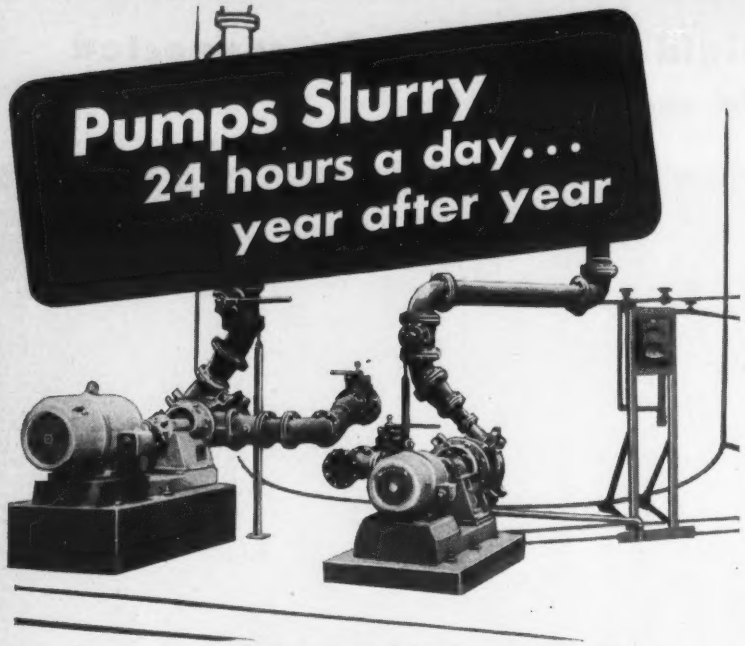
Flexible metal hose

Expansion joints.

Aircraft components

Metallic bellows

When inquiring check CP 1830 on handy form, pgs. 2-3



● MORRIS TYPE R SLURRY PUMP at the left is on continuous 24-hr. duty delivering 1000 GPM of a 170° lime slurry at 100' head. Fifty-HP motor operates at 1180 RPM. Intermittent-duty pump at right delivers 200 GPM at 50' head with 7½-HP motor turning at 880 RPM.

In slurry-handling operations, "long-term service" is a meaningless claim unless the pump will work day-in and day-out with a minimum of maintenance time, trouble and expense

Morris Type R Slurry Pumps—with an established reputation for longer life—also incorporate in their design exclusive features which result in easier installation . . . fewer interruptions to service...less overhaul...fewer replacements.

To provide uninterrupted service . . .

The gland is under suction pressure only. This reduces leakage and dilution . . . keeps harsh abrasives out of the stuffing box . . . practically eliminates packing troubles.

There are no internal studs or bolts. Caustic and corrosive solutions cannot seep past threads and cause maintenance headaches.

To make installation and dismantling easy . . .

Shell is interchangeable for right or left hand rotation. Suction and discharge nozzles can be rotated around the axis of the pump to a total of 72 different locations.

Impeller removed without disturbing the piping. You simply loosen 4 *outside* clamping bolts and pull off the end cover. This feature alone saves considerable time and labor.

● **Free Service.** Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send necessary data today . . . include request for Bulletin 181.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Sales Offices in Principal Cities

MORRIS *Centrifugal Pumps*

When inquiring check CP 1831 on handy form, pgs. 2-3

Merchandise stays dry from dock to car on rainy days . . .

eliminates delays due to inclement weather

Uses: To provide protective covering between freight car, trucks, and loading shed or warehouse door.

Features: Portable weatherproof canopy gives better working conditions, prevents accidents on wet dockboards and floor surfaces, and eliminates delays and damage due to inclement weather conditions.

Description: Weather screen is furnished with a patented hand clamp which is quickly and easily attached to any standard

The rain stays out; the cargo stays dry

boxcar door (automobile and furniture cars, too, if doors are left partially closed). Truck loading models for attaching to warehouse doors are also available up to 10 feet wide.

Standard weather screens are 6' wide, with canopy projections of 38, 50, and 62", depending on span from car door to warehouse door or loading shed.

There are three models which are available: Model A with overhead canopy only, Model B with overhead canopy and one attachable (right or left) side curtain, and Model C, shown in illustration above, with overhead canopy and two side curtains.

(Development of The Elwing Corporation, Department CP, 915 West Adams Street, Jacksonville 4, Florida . . . or reader may secure more information by simply checking CP 1832 on handy Reader Service slip located between pages two and three.)

Screw-Lift
PATENTED AND TRADE MARK REG U S PAT OFF

Does many chores . . . forms an integral part of any processing procedure

Receives MATERIAL
Conveys TO STORAGE
Reclaims FROM STORAGE
Delivers TO PROCESSING
Delivers TO PACKAGING
Recycles WHERE NECESSARY

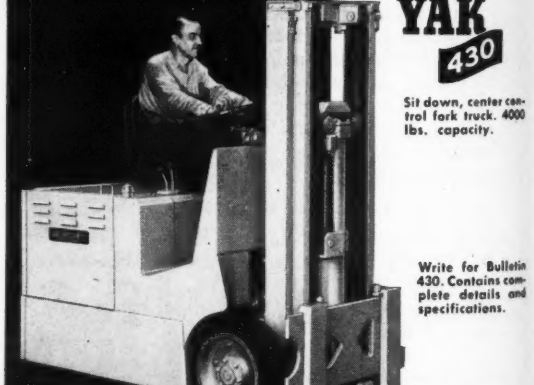
Screw-Lift is a dust-tight, totally enclosed, moisture-proof, sanitary, tubular conveyor that handles any free-flowing bulk material . . . conveying any distance horizontally and to any practical height to suit individual conditions. Requires no more space than a pipe of comparable diameter, piping solids as though they were a liquid, by means of a conveyor screw. Functions as an integral part of your production system, starting and stopping with the click of the switch. Cannot choke or harm materials. Accessible, easy to install, handles up to 3000 cu. ft. per hour.

Our full scale pilot plant will demonstrate Screw-Lift efficiency with your own material. Send sample or write for Form M-500-2

Screw Conveyor Corporation
699 HOFFMAN ST. HAMMOND, IND.
ENGINEERS HAMMOND PRODUCTS MANUFACTURERS

When inquiring check CP 1833 on handy form, pgs. 2-3

New... Mercury YAK 430



Sit down, center control fork truck. 4000 lbs. capacity.

Write for Bulletin 430. Contains complete details and specifications.

A major advance in fork truck design. Mercury "Yak" 430 incorporates...higher maximum fork elevation • increased free lift • greater speed • lighter chassis weight • shorter turning radius • simple *low pressure* hydraulic hoist system • new unit drive with quick detachable motor and self-energizing hydraulic brakes • new compensating castor type steering axle • Timken duo-grip parking brake actuated by driver's seat.

MERCURY MANUFACTURING CO. 4020 S. Halsted St., Chicago 9, Ill.

When inquiring check CP 1834 on handy form, pgs. 2-3

With 1 cu yd bite, tractor shovel can turn in 14' radius, has torque drive . . .

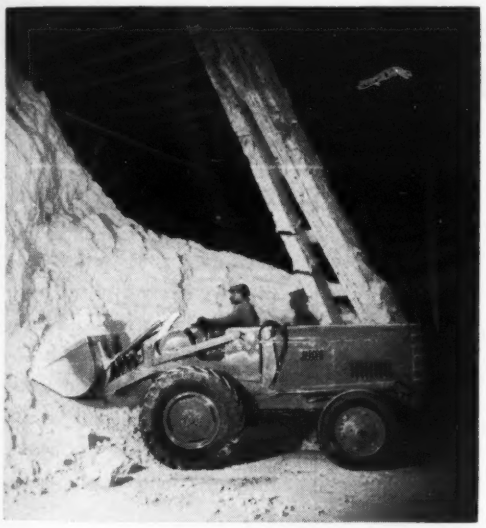
bucket goes up to 8'2" in 9 seconds, and there's no need to shift gears when loading

Uses: For handling bulk materials, drums and loose parts, car loading and unloading, car pushing, bulldozing, snow plowing and operating hydraulic hooks.

Features: One cubic yard unit pictured turns in a 14' radius, hoists bucket from ground to 8'2" dumping clearance in 9 sec. Torque converter drive eliminates shock loads on transmission and automatically applies power to accommodate the varying loads.

No need to shift gears when loading, since all loading functions are hydraulically actuated. In combination with 5-speed transmission, converter provides infinite number of gear ratios to meet the work.

Description: Manufacturer's tractor shovel has 18.7 mph forward speed, 28.2 mph in reverse. A single lever reverses travel direction without shifting speed gears. Rear axle steering is by power booster. For maximum traction and stability load is centered on 13:00 x 24 front driving wheels. Fifty-five hp engine (gas or diesel) is placed at rear to counterbalance bucket load. Ground clearance is 12".



Turns in a 14' radius

Machine has 24" reach at 8'2" dumping clearance (10'4" under bucket hinge), 34½" reach at 7' clearance. Other models are available in 12 cu ft, 5 cu ft, ⅝ and 1½ cu yd sizes.

(Development of The Jaeger Machine Co., Dept. CP, Dublin Ave., Columbus 16, Ohio . . . or reader may secure more information about this product by checking CP 1835 on handy Reader Service slip, pages 2 and 3.)

PATHFINDER CHEMICAL COMPANY

Three 4-inch S-A Zipper Conveyor-Elevators move 1500 pounds of granular resin from dryer units to storage units. The resin moves in a totally enclosed belt. From the driers the Conveyor-Elevators move horizontally before rising 26 feet vertically, then move horizontally again at right angles to the lower run.

this **S-A** CONVEYING *System* uses Zippers

to keep **GRANULAR RESIN CLEAN**

Eliminating all possibility of contamination, from both within and without the conveyor, is a No. 1 requirement in handling this pure granular resin. S-A engineers solved the problem with S-A Zipper Conveyor-Elevators that handle 1500 pounds per hour—in totally enclosed rubber tubes that prevent deposit of metallic particles due to abrasion. Faced with *any* bulk materials handling need—no matter how specialized or unusual—S-A engineers draw upon a vast store of experience and a complete line that includes every kind of bulk handling equipment. If you have a problem, why not put it up to them? In all probability they'll solve it for you and cut your handling costs besides. Write for a free survey.

REDLER Conveyor-Elevators
ZIPPER Conveyor-Elevators
Vibrating Conveyors
Belt Conveyors
Screw Conveyors
Bucket Elevators
Pan Conveyors and Feeders
Circular Bin Dischargers
Centrifugal Loaders and Pilers
TELLEVEL Bin Level Controls
Ship Loaders and Unloaders
Storage and Reclaiming Systems
Box Car Loaders and Unloaders
Bin Gates, All Types
SEALMASTER Ball Bearing Units

Write for Bulletins on any of the above.

STEPHEN S-A ADAMSON MFG. CO.

11 Ridgeway Avenue, Aurora, Illinois — Los Angeles, Calif., Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

When inquiring check CP 1836 on handy form, pgs. 2-3

. . . Type **"M"**

Three models . . . 450, 900 and 1800 CFM capacity . . . cleaned air can be vented to outside or returned to room.

dust problem?

here's the low cost solution . . .

KIRK AND BLUM unit dust collectors

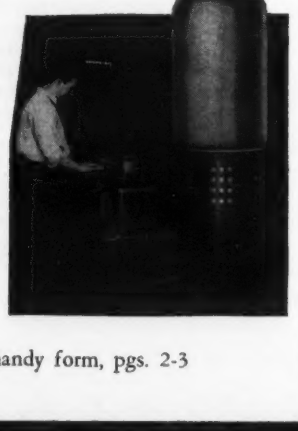
Where one or several dust-producing machines are operated without a dust collecting system or are too remote from the existing collection system, here's the efficient, trouble-free and low-cost solution. KIRK & BLUM Unit Dust Collectors are compact, easy to install or move, offer exceptional efficiency and capacity.

Both types have many features not found in conventional units, employing rugged material-handling fans and motors from ¾ to 3 H.P. They are specifically designed for trouble-free operation, easy cleaning and complete dependability.

For complete details, request literature on metal or woodworking types from The KIRK & BLUM MFG. CO., 3133 Forrer Street, Cincinnati 9, Ohio.

. . . Type **"W"**

Single model . . . 900 CFM capacity . . . ample for one 6", two 4" or four 3" pipe connections.



FOR CLEAN AIR . . . THE INVISIBLE TOOL

KIRK AND BLUM

DUST CONTROL

When inquiring check CP 1837 on handy form, pgs. 2-3

Expansion feature allows retracting or extending of conveyor unit to suit conveying needs . . .

boom on larger model reaches to 25′, retracts to 15′; another reaches from 11 to 18′

Uses: For loading or unloading trucks where one end is fixed to a conveyor line.

Features: Extendable boom is lengthened or shortened as the truck becomes full or empty. Telescope feature allows wheeled, powered unit to be used in confined areas or for compact storage.

Description: Two models of the Expand-O-Veyor are available. Larger model extends to 25′, retracts to 15′, smaller model has an 11 to 18′ range.

Larger unit is mounted on four 6″ diam swivel casters with foot locks, is driven by a 1 hp right angle gear head motor with a conveyor belt speed

Expands, retracts as you need it

of 76 fpm. Total capacity of this conveyor is 1000 lb uniformly distributed. Extended section is adjustable every 6″ and is secured in various positions by means of two spring-loaded pins which are released by a handle on one side.

The smaller size is mounted on four 8″ diam swivel casters also with foot locks, is driven with a ¾ hp right angle gear motor with a conveyor belt speed of 90 fpm. Total capacity of this conveyor is 750 lb uniformly distributed. All pulley shafts on both machines are mounted on anti-friction bearings. Two snub pulleys are located near the feed end driving pulley for obtaining the proper traction at this point on both machines. Flanged rollers on ball bearings carry the extended sections on both units.

Photo courtesy of The Oliver Corp., A. B. Farquhar Div.

(Development of A. B. Farquhar Div., The Oliver Corp., Dept. CP, York, Pa. . . or for more information check CP 1838 on handy form, pages 2 and 3.)

Speeds on lift truck drive wheels remain equalized, won't slip or start to spin . . .

special differential also compensates for unevenness or differences when turning

Uses: Differential is designed for use with manufacturer's LT-60 lift trucks and is adaptable to trucks of this model now being used.

☆

Every Article in CHEMICAL PROCESSING is "Staff Written"

Every article in CHEMICAL PROCESSING is terse, brief, to-the-point . . yet packed with essential facts of developments important to every man in chemical processing.

For every article is "Staff Written." Our Editors dig out the vital news-facts, then write them in the fewest possible words. That's why you read so much . . keep up with developments . . in short reading time. You don't have to "wade through" long, hard-to-read articles.

That's why you don't find these articles signed . . every one is "Staff Written." It's the most difficult kind of editing, but it pays big dividends to every busy reader.

☆

Features: In addition to maintaining equal drive wheel speeds, differential compensates for differences in wheel speeds when turning in either direction.

Description: NoSpin differential consists of two pairs of clutch teeth and two pairs of cams, so arranged that when lift truck is traveling in a straight forward direction the clutch teeth and cams are fully engaged, applying a driving torque to both drive wheels.

Clutch teeth and cams are so positioned that neither wheel can rotate more slowly than ring gear speed. Thus, if one wheel momentarily loses traction on a soft or slippery surface, the opposite wheel, which still has traction, continues to propel the truck until full traction on both wheels is finally regained.

Drive wheels will remain at equal speeds

With the differential, driving torque cannot force one wheel to spin faster than the opposite drive wheel. This applies whether the truck is traveling forward, reverse, or turning.

(Development of the Towmotor Corp., Dept. CP, 1226 E. 152nd St., Cleveland 10, Ohio . . . check CP 1839, pages 2 and 3.)

Describe hand, hydraulic lifting devices

Two bulletins describe manufacturer's portable lifts for one-man operation and for use with lighter loads of materials that are to be moved within the plant, especially for short distances.

Model J-300, of all-welded steel construction, has a "Magic Touch" release lever that eliminates waiting for 14 x 24" platform to lower.

Model S400 has a 58" lift of the 24x 24" platform, is similar in construction to the model described above, and is reported to enable one man to lift 500 lb with ease.

Bulletins describing both these models are issued by The Port-A-Lift Company, Dept. CP, 2998 N. Euclid Ave., Bay City, Mich. When inquiring specify CP 1840, pgs. 2 & 3.

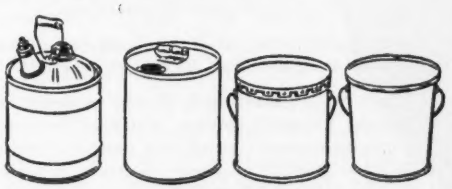
Continental's artists translate ideas into packages that sell

MAY WE TAILOR A STEEL CONTAINER FOR YOU?

To Continental people, your bulk products are personalities. And we do our best to hand-tailor containers that exactly fit their needs.

As one of the few steel container manufacturers who also make tin cans, we have an experience in lithographing-on-metal that's hard to equal. Our artists are masters at adapting designs to look well on pails, drums and handi cans of varying sizes and shapes. Our platemakers and pressmen have the most modern of equipment with which to work.

No two steel container users have exactly the same problems. From long experience we have built up a list of package services that our customers have found helpful. We'd like a chance to hand-tailor these services to *your* particular requirements.



CONTINENTAL CAN COMPANY

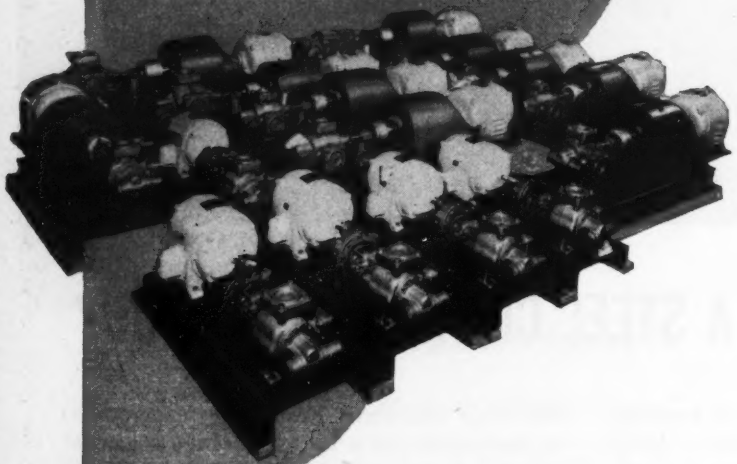
Continental Can Building, 100 E. 42nd Street, New York 17, N. Y.

EASTERN DIVISION 100 E. 42nd St., New York 17
CENTRAL DIVISION 135 So. La Salle St., Chicago 3
PACIFIC DIVISION Russ Building, San Francisco 4

When inquiring check CP 1841 on handy form, pgs. 2-3

ROPER

fills a **BIG** ORDER . . .
for a **BIG** PROCESSING INSTALLATION



Big order, yes! And the BIG factor that prompted the selection of the fifteen Roper Series 3600 Pumps shown was *dependability*.

Dependability as only painstaking engineering, quality components, and accurate assembly can bring.

Dependability that serves your interests on both long and short runs whether handling thick or thin liquids.

Roper Series 3600 Pumps feature hardened helical gears running in axial hydraulic balance, high lead bronze bearings, split ring packings and split gland, and adjustable relief valve . . . are made in 40 to 300 G.P.M. sizes — pressures to 60 P.S.I. Send today for Catalog 953 giving complete data on Roper pumps, or see your Roper distributor.

ROPER
Rotary Pumps

GEO. D. ROPER CORPORATION
746 BLACKHAWK PARK AVENUE, ROCKFORD, ILLINOIS

When inquiring check CP 1842 on handy form, pgs. 2-3

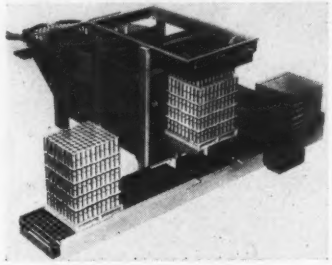
MATERIAL HANDLING

Unloads palletized 'bright' cans at high speeds — 1200 cases/hr

pick-up unstacks, single-files cans for labeler

Uses: Automatic unloading of palletized cans stored without labels (bright).

Features: Performance tests, in plants where unloader is installed, show processors can save from 2



Pallet unloader uses magnetic pick-up to unstack loaded pallets and align cans

to 4 cents per case in labeling operations, depending on degree of mechanization in their present operations. Savings can pay for unit in two or three years, depending on number of cases which may be stacked bright.

Unit offers gentle handling, flexibility to handle all standard can sizes, and adaptability to large or small operations, according to manufacturer.

Description: Employs electromagnetic pick-up to unstack loaded pallets, then single-files cans in proper position for labeler at rate of 1200 cases or more per hour (No. 2 cans) depending on can size. Pallet unloader is able to handle cans in either straight or nested patterns.

(Stackomatic Pallet Unloader is a product of Food Machinery and Chemical Corp., Dept. CP, P.O. Box 760, San Jose 6, Calif. . . . or for more information about this particular development simply check CP 1843 on convenient Reader Service slip located between pages two and three.)

PROCESSING & ENGINEERING
DATA Section
on pages 200, 202, 204, 206

"Weld-Bilt" EQUIPMENT GIVES YOU
LONGER SERVICE IN LABOR-SAVING MATERIALS HANDLING

You can SEE the greater strength and durability in WELD-BILT Equipment . . . in heavier arc-welded construction, in sturdier operating parts, in many innovations that assure easier, friction-free operation. Every piece of "Weld-Bilt" equipment is designed to save operator fatigue, protect product and save money both on original cost and maintenance expense.

You can easily PROVE "Weld-Bilt's" superiority through many more years of actual performance in hundreds of plants all over the Nation. It means your lowest possible investment-per-year in time and labor saving.

"Weld-Bilt"
PRODUCTS
Two-Wheel Hand Trucks
Portable Electric Elevators
Pallet-Type Hydraulic Lift Trucks
Hydraulic Lift Trucks
Skid Platforms
Platform Trucks
Write or wire for prices today . . or for engineering assistance on your handling problems or plans.
WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS
327 Water Street, West Bend, Wisconsin

When inquiring check CP 1844 on handy form, pgs. 2-3

● NOW you can handle granular fines without danger of contamination! Blaw-Knox Chemical and Fertilizer Buckets are equipped with tight fitting cast chrome-nickel-molybdenum alloy steel lips to stop leakage and resist abrasion. For a detailed description on all the important features, write for Bulletin 2236.

BLAW-KNOX COMPANY
Blaw-Knox Equipment Division
2076 Farmers Bank Bldg., Pittsburgh 22, Pa.
Offices in Principal Cities

BLAW-KNOX CLAMSHELL **BUCKETS**
FOR CHEMICAL AND FERTILIZER PLANTS

When inquiring check CP 1845 on handy form, pgs. 2-3

Multi-purpose hoist adaptable to wide variety of jobs in load moving . . .

capstan-type drum on lightweight, portable powered unit gives critical control

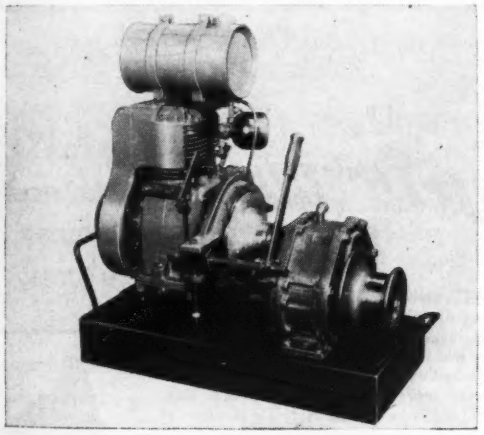
Uses: For accurate spotting of materials in industrial plants and warehouses or along piers and docks.

Features: Equipped with two gripper-type handles, lightweight winch is portable, employs capstan-type drum for critical control of loads.

Description: Standard models, with either electric or gasoline power units, range in size from 3 to 7½ hp. Fabricated all-steel base may be secured by ½" lag bolts to provide stable platform for pulling or lifting.

In operation, capstan permits operator to "skid" the line by slacking off pressure while the capstan is rotating. With this principle, a heavy load may be taken up and stopped very slowly, with no stress on rigging or equipment.

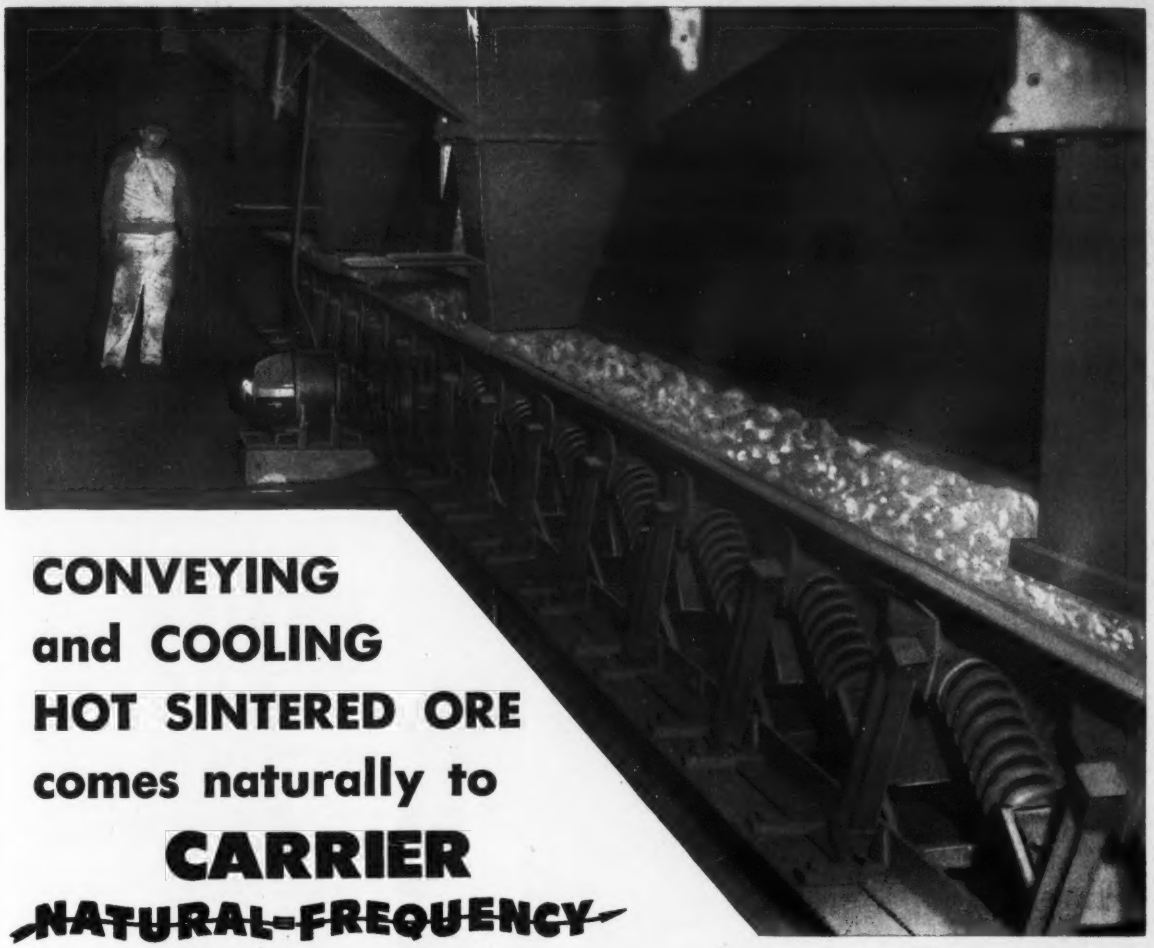
Gypsiwinch is also available in combination with cable drum, permitting use of either hoisting cable or manila line. Gasoline and electric power units used are instantly reversible, are operated by conveniently located lever control. Mechanical efficiency of more than 95 per cent is obtained on reduction units, manufacturer reports, thus allowing extremely high torque as well as high horsepower delivery.



Portable winch has capstan-type drum, gears run in oil

Gears are completely enclosed for silent operation and run in a continuous oil bath. Motor, drum and pinion shafts are ball-bearing mounted. Base dimensions of portable winch range from 12 x 32" to 12 x 42".

(Development of Dept. KP, St. Anthony Machine Products Co., Dept. CP, 2424 East Franklin Ave., Minneapolis 6, Minn. . . . or for more information check CP 1846 on handy form between pages two and three.)



CONVEYING and COOLING HOT SINTERED ORE comes naturally to CARRIER ~~NATURAL-FREQUENCY~~ CONVEYORS

Carrier Natural-Frequency Conveyor in Alan Wood Steel Co. plant, Conshohocken, Pa.

Conveying and cooling up to 40 tons of hot sintered ore an hour is a "natural" for Carrier Natural-Frequency Conveyors. The 57-foot unit in Alan Wood Steel Company's Conshohocken plant, above, is powered by one 7½ H.P. drive and has a one-piece steel-plate pan, ½" thick. It receives the 700° (F.) ore from hoppers, then quickly vibrates it to storage with a gentle, abrasion-free motion. The conveying speed is 90′ per minute.

Notice that no water jackets are required for cooling — the conveyor's spring hangers have air-gap insulation spaces that not only cool the pan and ore, but also eliminate the possibility of corrosion and leakage!

And because of exclusive Natural-Frequency design, there's an absolute minimum of maintenance and down-time!

Hundreds of America's leading industrials are now using Natural-Frequency Conveyors and processing equipment for many hard-to-handle products — things like limestone, coke, mill scale and slag . . . cement clinker . . . castings . . . machine turnings . . . sand . . . minerals . . . plastics . . . bulk chemicals . . . food products. If *you* handle "tough" materials — anything hot, sharp, wet, abrasive, friable, brittle, stringy, jagged or oily — it will pay you to get the whole Natural-Frequency story. Mail the coupon, *today!*

Carrier Conveyor Corporation — Dept. 13
Frankfort Avenue at Clifton, Louisville 6, Ky.

Gentlemen: Without obligation, please send complete information on Carrier Natural-Frequency Conveyors.

Firm_____

Street_____

City_____ State_____

Att: Mr._____ Dept._____

When inquiring check CP 1847 on handy form, pgs. 2-3

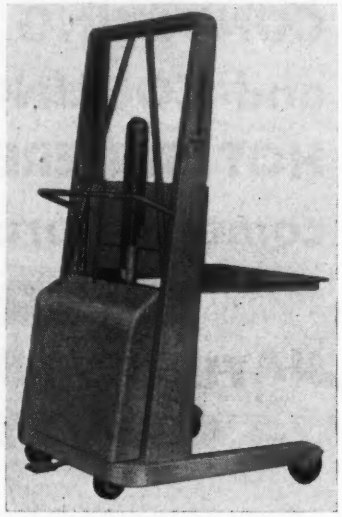
1000-lb load from floor to 48" in 15 seconds is truck feat . . .

descent or stops controlled from operator's fingertips

Uses: For general lifting and materials handling of loads up to 1000 lb.

Features: By fingertip electrical control, unit lifts 1000-lb load from floor to 4' height in 15 seconds, gives controlled descent of load or stops it at any intermediate position.

Description: Manufacturer's model 1000-E combination hydraulic-electric lift truck has elec-



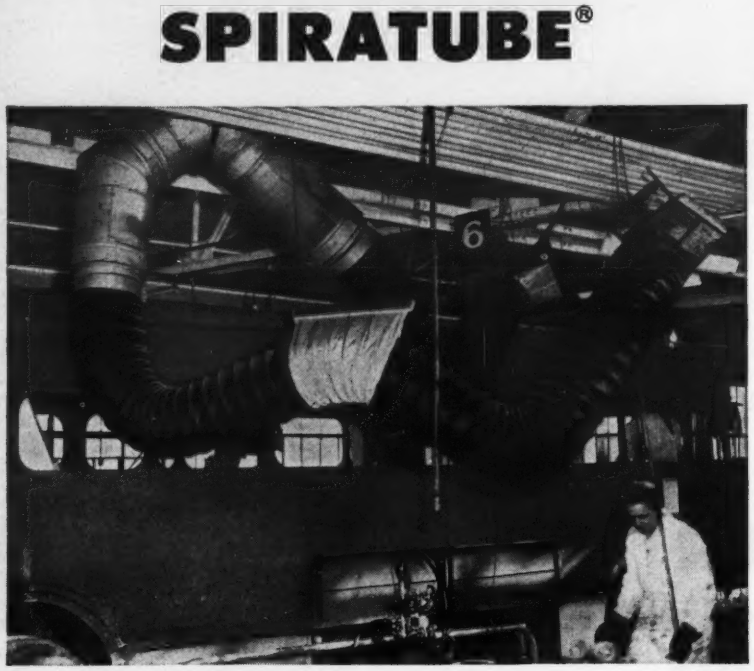
Takes 1000-lb load to 48 inches in 15 seconds

tric lift actuated by a piston-type hydraulic pump, powered by a 6 v electric motor. Automotive-type storage battery, equipped with battery charger for overnight charging, supplies current to power the unit.

Platform measures 23 x 24". Overall unit height is 64", base area is 29" wide, 34" long. For maximum maneuverability, mobility, and load distribution, unit has two fixed-position large diam front wheels and two swivel-type trailing wheels.

(Development of Century Products Co., Dept. CP, 5925 Highway 7, Minneapolis 16, Minn. . . . or for more information check CP 1849 on handy form, pages 2 and 3.)

IF YOUR DUCTING SYSTEM HAS "THE BENDS" call in the top specialist— SPIRATUBE®



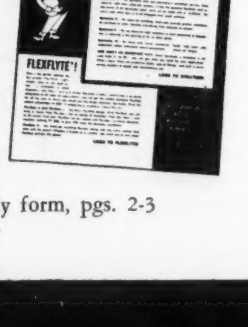
Look at the bulky, unadaptable and costly rigid ducting to which versatile SPIRATUBE has been attached in the above application. If your dust and fume removal... air handling of any kind... requires ducting that will take 'the bends' anywhere and often, ducting that can follow work around, you should know about inexpensive SPIRATUBE. It's easily, quickly installed... offers MINIMUM WEIGHT — MAXIMUM FLEXIBILITY.

Standard sizes with various fabrics and coatings for all requirements are immediately available from well-stocked distributors — coast-to-coast!

Write today for full details on Flexible's amazing cost-saving ducting!

Flexible Tubing CORPORATION

Guilford, Connecticut Pasadena 1, California



When inquiring check CP 1848 on handy form, pgs. 2-3

MODERN TIME AND COST SAVERS BUILT BY... Standard GRAVITY & POWER CONVEYORS

LIFT OR LOWER— FLOOR TO FLOOR WITH A

STANDARD INCLINEBELT

Move boxes, cases, cartons, sacks or bundles from basement to first floor, or any floor to floor — continuously with the Standard Inclinebelt. Compact — simple to install — minimum maintenance and attention. Lifts or lowers 10 to 20 lbs. of live load per ft.; floor elevations of 8 ft. to 14 ft. 6 inches inclusive; two belt widths to handle commodities 15½ inches to 25½ inches wide. Electric motor operated. Write for INCLINE-BELT Bulletin — address Dept. CP-63.

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minn.
Sales and Service in Principal Cities

When inquiring check CP 1850 on handy form, pgs. 2-3

Save time! Prevent accidents!

LIFT AND DUMP MECHANICALLY

BAGS BARRELS DRUMS BOXES

REDUCE HANDLING COSTS with a Cesco Dumper. It handles up to 100 loads per hour; has a lifting cap. ranging from 100 to 1500 lbs. Both single- and multi-purpose portable models are built in standard dumping heights from 5 to 12 ft. Stationary models up to 16 ft. dumping heights. Push button controlled. Write for catalog.

ESSEX CONVEYOR, INC.
101 Colden Street • Newark, New Jersey

COLSON EQUIPMENT & SUPPLY CO.
1317 Willow Street • Los Angeles 13, California

When inquiring check CP 1851 on handy form, pgs. 2-3

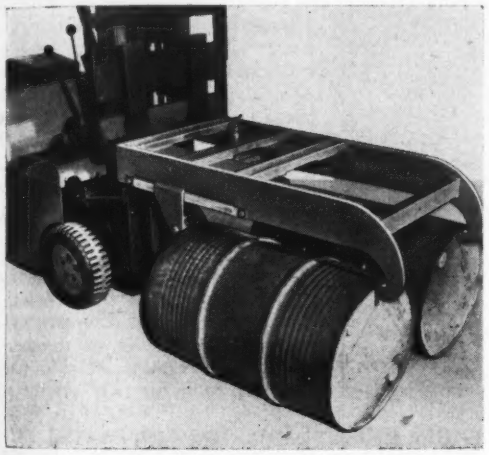
Drums from 26 to 38" overall length can be lifted and tiered singly or in pairs . . .

horizontal handling attachment automatically adjusts in size for wide range

Uses: Designed for use on manufacturer's entire line of fork trucks, attachment provides for semi-automatic lifting and tiering of drums, full or empty, singly or in pairs.

Features: Attachment handles drums ranging in overall length from 26 to 38", requires no tools for mounting and dismounting, automatically adjusts to drum size.

Description: Drum handler consists of two parallel arms with self-actuating levers projecting forward for horizontal drum grasp, is constructed



One or two drums at a time can be lifted and tiered

of heavy steel plate. Steel channel sections provide maximum rigidity and alignment. Overall width of the attachment is 26½", weight is approximately 300 pounds.

Device is suspended from standard truck forks which are inserted into the two channel-supports forming an integral part of the handler. Fork channels are located immediately beneath the cross-support arms of the attachment. Easy installation or removal is accomplished by inserting or removing the forks.

Semi-automatic adjustment to various drum sizes is accomplished by rear finger-levers designed to slide along the lower edges of the handler arms. They operate individually and are spring-actuated for automatic retraction against drum rims when the load is lifted. They then lock against slipping. Lifting and tilting of the uprights are in no way affected by use of the drum handler, it is reported by manufacturer.

(Development of the Industrial Truck Div., Clark Equipment Co., Dept. CP, Battle Creek, Mich. . . . or for more information reader may simply check CP 1852 on convenient Reader Service slip between pages two and three.)

Material: Activator solution—water with 5% ferro-sulphate.

Problem: Short service life of turbine pumps; sometimes only two weeks.

Solution: First Moyno ran 6 months without a breakdown. Using relief valves, pressure is kept at constant 120 p.s.i. Now using 7 Moynos because of this exceptional service.

Material: Anti-scale boiler treatment. (Alcohols, oils, anti-foam agents, sludge conditioners.)

Problem: Frequent pump breakdowns caused by back pressure of spray nozzles; and abrasion.

Solution: Moyno pumps cut pumping time from 20 minutes to 3, reduced down-time, increased production 200%!

Material: Caustic solution—for use in mercerizing machines.

Problem: Rotary pumps wore quickly; lost capacity, and did not have enough suction.

Solution: Moyno pumps cut maintenance and repairs to minimum—had ample suction for drawing caustic through the cloth.

Material: 40° copperas crystals in 20% sulphuric acid.

Problem: Low production of diaphragm pump.

Solution: Moyno pump handles an increased percentage of solids, which in turn increases production.

Material: Calcium carbonate slurry.

Problem: Continuous failures of centrifugal pumps.

Solution: Moyno pump still giving perfect service after 1½ years. Service is practically continuous—with pump in operation 24 hours per day.

Material: Size—containing china clay and latex.

Problem: Centrifugals unable to handle viscosity—causing frequent trouble.

Solution: Moyno pump has been on duty for a year. Pump trouble completely eliminated; no repairs required.

Six Chemicals-Handling Problems... Solved by the MOYNO PUMP!

Features of the MOYNO that may solve YOUR pumping problem

Positive Displacement—Moynos are available to pull up to 29" vacuum while discharging under pressure. Big Moynos deliver up to 250 g.p.m. at pressures to 600 p.s.i.

Gentle—No churning; won't break up semi-solids; won't aerate liquids.

Reversible—The Moyno pumps with equal efficiency in either direction.

Versatile—handles liquids, abrasive slurries, pastes—even potato salad! Rotor and stator are available in stainless steel, other alloys or plastics to meet a wide variety of applications.

Trouble-Free—self priming; won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service. Easy to maintain.

Looking for a pump with a fast-growing reputation for solving tough pumping problems? Then take a look at the simple, versatile Moyno!

Briefly described above are a few of the many successful case histories proving how Moynos handle jobs where other pumps fail. Why is the Moyno a "problem-solving" pump? For one thing, because it differs completely from conventional pumps . . . rotary, centrifugal or piston. Just one rugged moving part—a rotor turning within a stator—does the job.

The list of chemicals handled by Moynos gets longer every day. If *you* have a pumping problem, such as handling abrasive slurries, mild acids, caustics—watery, viscous or even semi-solid—find out if the Moyno can help you! Use the coupon below for prompt, complete information.

ROBBINS & MYERS • INC.

SPRINGFIELD 99, OHIO • BRANTFORD, ONTARIO

Fractional & Integral h.p. Motors & Generators | Electric Fans | Electric & Hand Hoists & Cranes | Moyno Pumps | Propellair Industrial Ventilating Equipment

Robbins & Myers, Inc. CP63
Pump Division, Springfield 99, Ohio

Gentlemen: Please mail free copy of Bulletin 30-B containing details on construction and operation of Moyno Pumps:

*Name*_____ *Title*_____

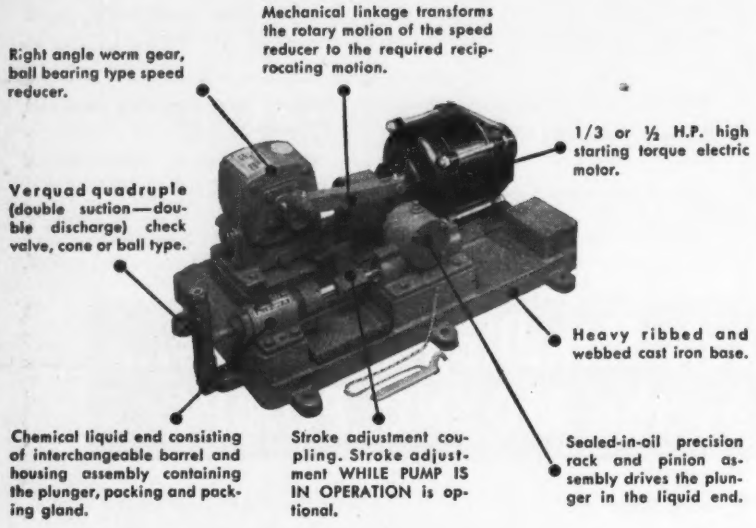
*Company*_____

*Address*_____

*City*_____ *State*_____

When inquiring check CP 1853 on handy form, pgs. 2-3

Simplicity of design plus precision manufacture


Mechanical linkage transforms the rotary motion of the speed reducer to the required reciprocating motion.
Right angle worm gear, ball bearing type speed reducer.
1/3 or ½ H.P. high starting torque electric motor.
Verquad quadruple (double suction—double discharge) check valve, cone or ball type.
Heavy ribbed and webbed cast iron base.
Chemical liquid end consisting of interchangeable barrel and housing assembly containing the plunger, packing and packing gland.
Stroke adjustment coupling. Stroke adjustment WHILE PUMP IS IN OPERATION is optional.
Sealed-in-oil precision rack and pinion assembly drives the plunger in the liquid end.

assure high standards of accuracy and dependability in Hills-McCanna "U" type metering and proportioning pumps

Whenever small volume flows must be metered or proportioned continuously, the simple, foolproof design of Hills-McCanna "U" Type Pumps pays big dividends. For flows up to 24 gallons per hour per feed, its accuracy and reliability suit it for research, pilot plant operation and full scale processing alike.

The "U" type pump is available in a range of capacities with 1, 2, 3 or 4 feeds. Its design permits use of a wide variety of materials of construction in the liquid end.

Write for descriptive literature which gives full information.
HILLS-McCANNA CO., 2370 W. Nelson Street, Chicago 18, Ill.

HILLS-McCANNA

metering and proportioning pumps

Also Manufacturers of:
SAUNDERS TYPE DIAPHRAGM VALVES
FORCE FEED LUBRICATORS • MAGNESIUM SAND ALLOY CASTINGS

When inquiring check CP 1854 on handy form, pgs. 2-3

Two-yard track-type shovel digs in, lifts, carries, and dumps loads, has handy control levers . . .

rear mounting of hydraulic system keeps hoses out of operator's way

Uses: For digging, lifting, carrying and dumping loads of material with mobile, track-type tractors.

Features: Tractor shovel has two-yard capacity designed for balance and stability. Rear mounting of hydraulic system permits better radiator cooling; hoses are kept out of way of the operator. In both the raised-carry and the raised-dump positions, operator has unobstructed visibility to both front and rear.

Description: The No. 6 Shovel is powered by a 66-drawbar-hp crawler on a non-oscillating track frame. The lift cylinders are horizontally mounted above the tracks to avoid possibility of clogging with dirt and side door panels prevent dirt from reaching the engine.

Unit has good frame clearance underneath. There is also a heavy-duty bumper guard in addition to the customary radiator guard. A heavy section cross brace between the lift arms maintains bucket stability.

Dumping height is 10′ 9″ with a reach of 3′ 5″, thus insuring dumping of materials in the center of all standard hauling units. Control levers for the bucket (made of layer plate to withstand abrasive action) and the lift arms are located so both may be engaged operated with one hand.

The hydraulic lift arm control lever, once engaged, remains in position without holding. Operator has both hands free to shift gears or turn the shovel, while bucket continues lifting. At the maximum lift, an automatic kickout disengages the lever.

Unit has five gears forward, four in reverse. The 18″ flat center shoes were designed specifically for tractor shovel work and combine features of floatation, traction, and resistance to slip. Raised center of the shoe serves as street plates and the cut-out centers give better clearance action. Detachable grousers are available, if desired.

(Development of the Caterpillar Tractor Co., Dept. CP, Peoria 8, Ill. . . . or for more information check CP 1855 on handy form, pages 2 and 3.)

Dangerous nails, tacks, tramp iron are quickly swept from floors, roads, parking areas . . .

magnetic unit can be used manually, towed behind vehicle, or attached to lift truck

Uses: For removing nails, tacks, tramp iron, metal chips and shavings from factory aisles, areaways and parking lots.

Features: Unit can be pushed, pulled or suspended. V-shaped handle is equipped with a loop that allows attaching to almost any trailer hitch.

Would you like to receive CHEMICAL PROCESSING personally?

It will be sent to you without charge or obligation . . .

. . . if you qualify
. . . if you request it

If you are responsible for processing operations in an administrative capacity as plant superintendent, chemical engineer, chemist, engineer or equivalent responsibility . . . in a plant of substantial operations* where chemical processing is an important factor . . . CHEMICAL PROCESSING will be sent to you without charge or obligation if you request it. Use form below. In requesting, be sure to answer all questions. If your firm is not rated or listed in standard references, indicate size of the company by capacity, annual sales or number of employees. Unless all information is given, magazine will not be sent.

*"Substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

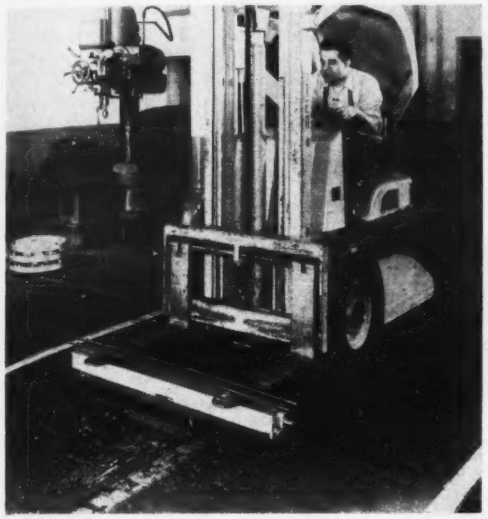
CHEMICAL PROCESSING
111 EAST DELAWARE PLACE
CHICAGO 11, ILLINOIS

Please send me CHEMICAL PROCESSING without charge or obligation

Name _____
Title _____
Company _____
Rating of Company _____
Street _____
City _____ Zone _____
State _____
Main Products _____

Handle and wheels are removable so that device can be secured to and suspended by forks of lift truck. Heavy-duty models of the sweeper operate efficiently at speeds up to 10 mph.

Description: "Super-Sweeper" unit is equipped with Alnico V magnetic element that snaps up and holds tramp iron that comes in its path. Unit is made in three strengths and four widths: 24, 36, 48 and 60" sizes. Removable handle is of tubular steel. Wheels are fitted with 8.00 x 2" tires. Attached to each side of the magnet's face is a stainless steel deflector which prevents damage to the face if large objects are encountered. Sweeper is quickly cleaned by turning the magnetic face up with the handle and stripping metal accumulation from the canvas cover.



Chips and shavings are quickly removed

(Development of the Eriez Manufacturing Co., Dept. CP, Erie, Pa. . . . or for more information check CP 1856 on handy form, pages 2 and 3.)

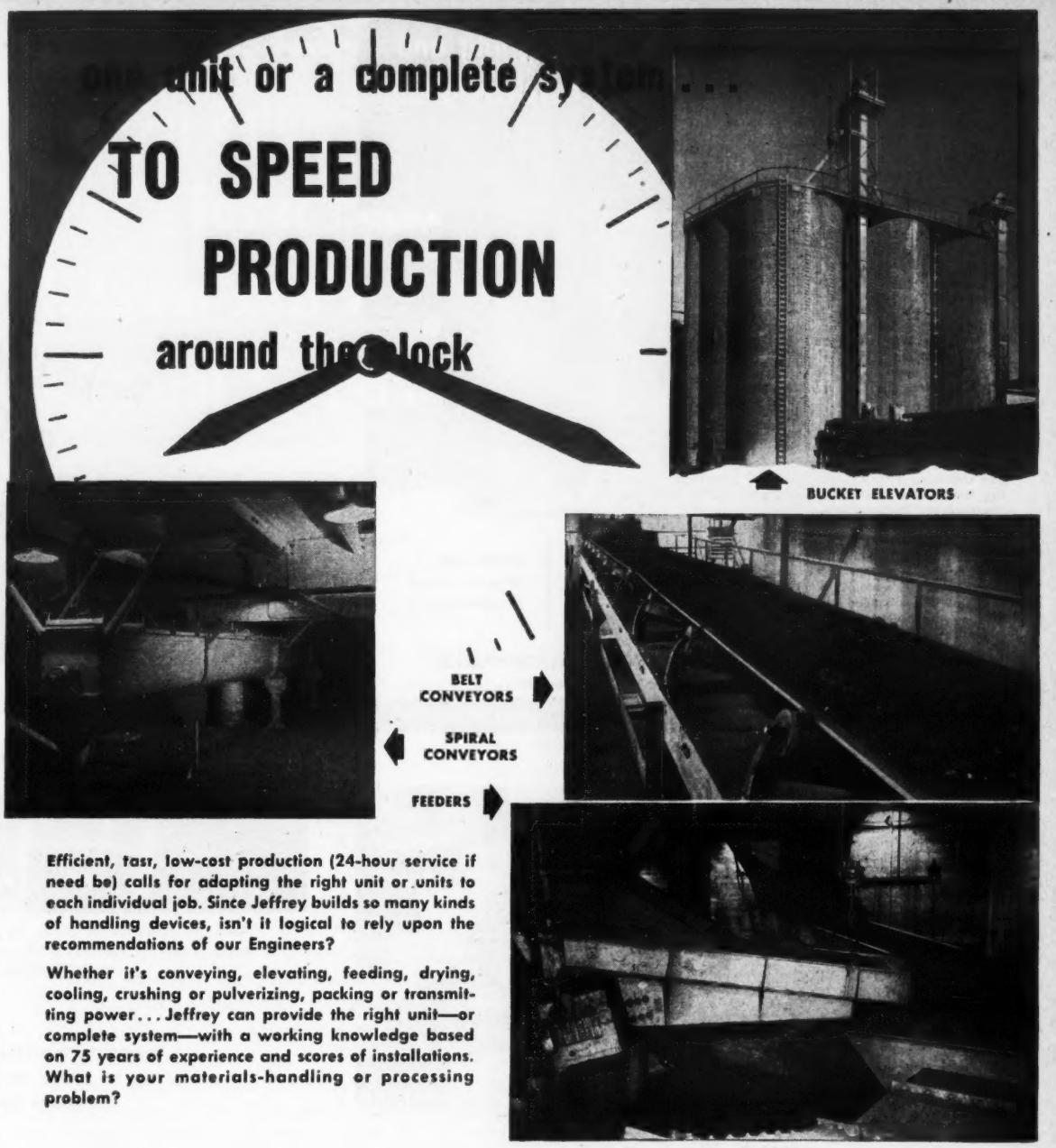
Vacuum-tight seal is formed by ceramic metallizing . . .

seal is said to withstand temperatures to 650°F; plating on metallized surface won't blister, peel

Vacuum-tight seals can be produced by a process just announced for metallizing ceramic materials to provide for attached metal parts. Besides, the seals are said to withstand operating temperatures to 650°C, and to surpass JAN thermal shock requirements. Plating upon the metallized surface will not peel or blister, it is reported.

The process, AV55, will at first be available on the basis of custom design and manufacture.

(Announced by Advance Vacuum Products, Inc., Dept. CP, P.O. Box 197, Southport, Conn. . . . or for more information check CP 1857 on handy form, pages 2 and 3.)



Efficient, fast, low-cost production (24-hour service if need be) calls for adapting the right unit or units to each individual job. Since Jeffrey builds so many kinds of handling devices, isn't it logical to rely upon the recommendations of our Engineers?

Whether it's conveying, elevating, feeding, drying, cooling, crushing or pulverizing, packing or transmitting power . . . Jeffrey can provide the right unit—or complete system—with a working knowledge based on 75 years of experience and scores of installations. What is your materials-handling or processing problem?

THE JEFFREY MANUFACTURING CO.
ESTABLISHED 1877
Columbus 16, Ohio
sales offices and distributors in principal cities
PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

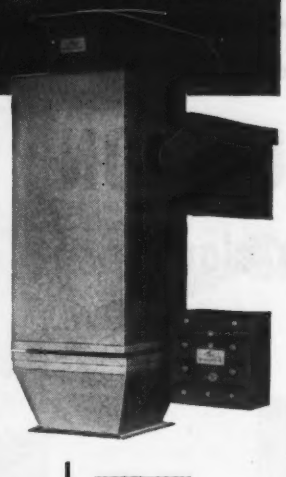
IF IT'S MINED, PROCESSED OR MOVED
. . . IT'S A JOB FOR JEFFREY!

When inquiring check CP 1858 on handy form, pgs. 2-3

NOW-faster and more precise bagging and batchweighing

Fill up to 12 bags per minute to within 1/10 pound accuracy

THAYER - Fully-Automatic Net-Weighing Filling Scale



Whether you are batchweighing for formulations . . . or bagging for shipment . . . you can speed up filling and weighing operations — and get greater accuracy, too — with a Thayer *Fully-Automatic* Net-Weighing Scale. Chemicals, plastics and other dry materials in powder, granulated or pellet form are readily handled by a unique feeding system that closely controls amount and rate of flow. Any free-flowing or flooding material may be handled with accuracy and speed. The weighing and discharging operation is completely automatic from the time the material enters the hopper until the precisely weighed load is released.

Thayer Net-Weighing Scales handle weight units from 1 to 500 pounds at speeds up to 10 units per minute. Outstanding Thayer shockproof leverage system — without wear vulnerable knife edge pivots — guarantees continued accuracy. Stainless steel hopper and feeding system offer maximum protection against corrosive chemicals and contaminaton.

Thayer Gross-Weighing Scales are also available for filling directly into bags and drums.

Checkweighing Problems? . . . write for information on new Thayer Checkweight Scales which *automatically* indicate weight of filled containers and then separate off-weight units from properly filled packages! Complete line of checkweighers available for packages weighing from 1 to 200 pounds at rates up to 60 packages per minute.

MODEL 600N

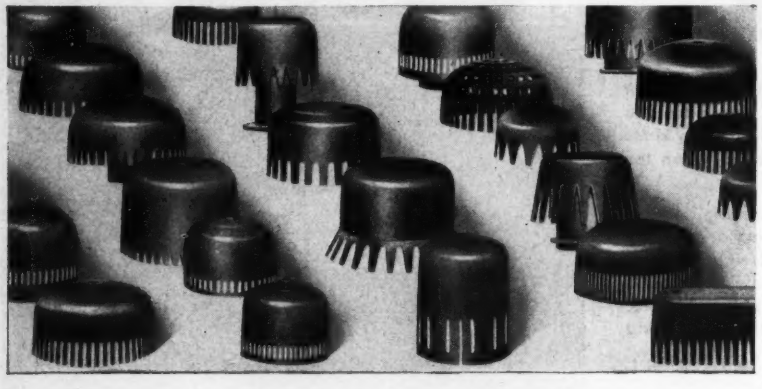
Write for detailed description today!

THAYER SCALE AND ENGINEERING CORPORATION

492 East Water Street, Rockland, Mass.

Where weight is worth money . . . it pays to be sure!

When inquiring check CP 1859 on handy form, pgs. 2-3



SEND FOR PSC

BUBBLE CAP BULLETIN 21

Largest Compilation of Engineering Data.

Lists 200 Styles Furnished Without Die Cost.

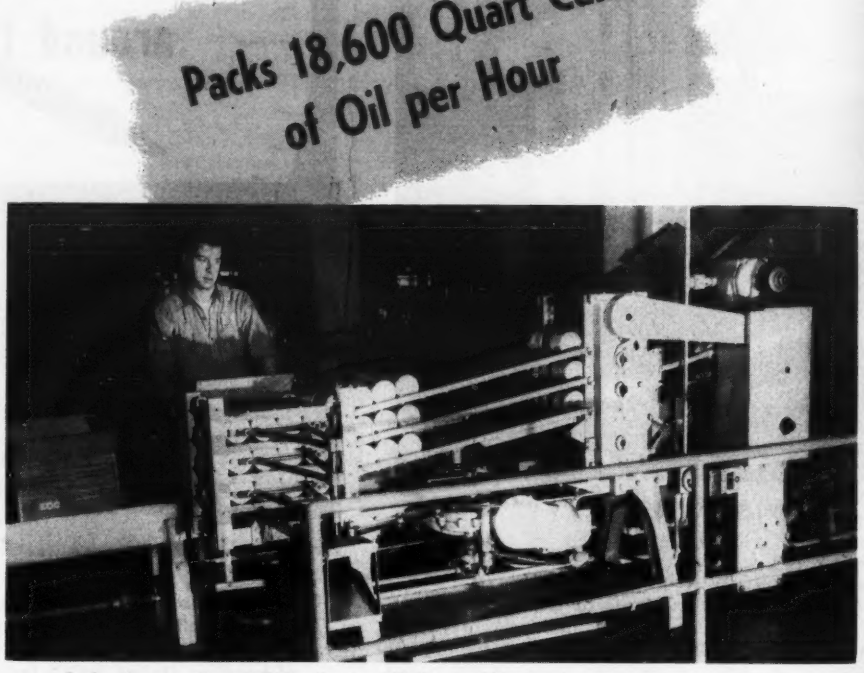
This standard reference contains complete specification information for over 200 standard styles of bubble caps and risers. Also drawings for use in determining methods of tray assembly. All styles listed in Bulletin 21 are furnished promptly, without die cost, and in any alloy to meet your coking or corrosion problems. Special caps gladly designed; write as to your needs.

THE PRESSED STEEL CO., 709 N. Penna. Ave., Wilkes-Barre, Pa.

Custom Fabricators for the Process Industries Since 1928. Send Your Blue Prints

When inquiring check CP 1860 on handy form, pgs. 2-3

Packs 18,600 Quart Cans of Oil per Hour



Packer in operation at Cities Service Oil Co. in Chicago. Long runway assures an adequate supply of cans to avoid delays. Also note that cases are filled while in the horizontal position, the most convenient for the operator

Prevents marring of labels and permits one person to place as many cans in cases as three or more operators packing by hand

MECHANICAL packer in use at Cities Service Oil Co. in Chicago allows one person to place 18,600 quart cans of motor lubricating oil per hour into cases. It would take three or more operators packing by hand to obtain the same output. This is twice the speed of other packers that have been used by company in the past. The average packing rate, equivalent to 310 cans per minute, varies according to how fast the filling unit runs. For heavier oil, which takes longer to fill, packing rate is 300 cans per minute, while 320 or more cans of light oil are handled per minute.

In addition to saving labor, unit delivers cans that are in better condition. Can separating unit is free of blades, knives, and fingers, assuring that cans will not be dented nor the labels scarred. Another label-scuff preventive is the vertical position of the can plunger throughout its complete travel. This eliminates any appreciable movement of the flanges of cans against the bodies of adjoining ones.

An arranger first receives cans close to the floor, elevates them to a height sufficient to provide gravity flow, and distributes each can to the proper runway in sequence. Packer has balance beam controls which assure an adequate supply of cans to the arrangers and prevent an oversupply to the magazine.

Longer runways than were employed pre-

viously provide additional storage of cans to insure a sufficient number rolling off the shelves to prevent delays in production. Operator never has to wait for the collection of a sufficient number of cans to fill case prior to depressing the clutch release. Another advantage is the horizontal case funnel, the most convenient position for the operator. Only one push is required to fill the cases instead of the two used on some other machines.

According to the plant supervisor, the packer very seldom stops the production line. It has been in operation slightly more than three years, since May of 1950. During that period it is considered to have performed very satisfactorily. Unit has required practically no maintenance during the three years of operation.

One design feature is the drop shelf type of separator which is in line with the magazine tracks prior to performing its separate function. This assures an immediate roll of cans to the shelves en masse. Shelves then drop by gravity, the cans nearest those in the runway moving away. Can separation is accomplished without force or friction.

According to manufacturer, the four driving pawls on the clutch instead of the customary single pawl, reflect the sturdiness of the drive unit, the smoothness of the operation being noteworthy. Anti-jam feature embodying a pair of coil springs which yield makes packer safe. Portability is a convenience when a change of location is desired.

Cities Service is using packer for their Koolmotor and Trojan lines of motor oil. Twenty-four quart cans of oil are packed in each case in two layers of 12 each. They also have another packer of the same type in operation, only it is designed for handling five quart cans.

(Model PCS Packer is product of Burt Machine Co., Department CP, Oliver and Barclay St., Baltimore 2, Maryland . . . or reader may secure more information by simply checking CP 1861 on convenient Reader Service slip between pages two and three.)

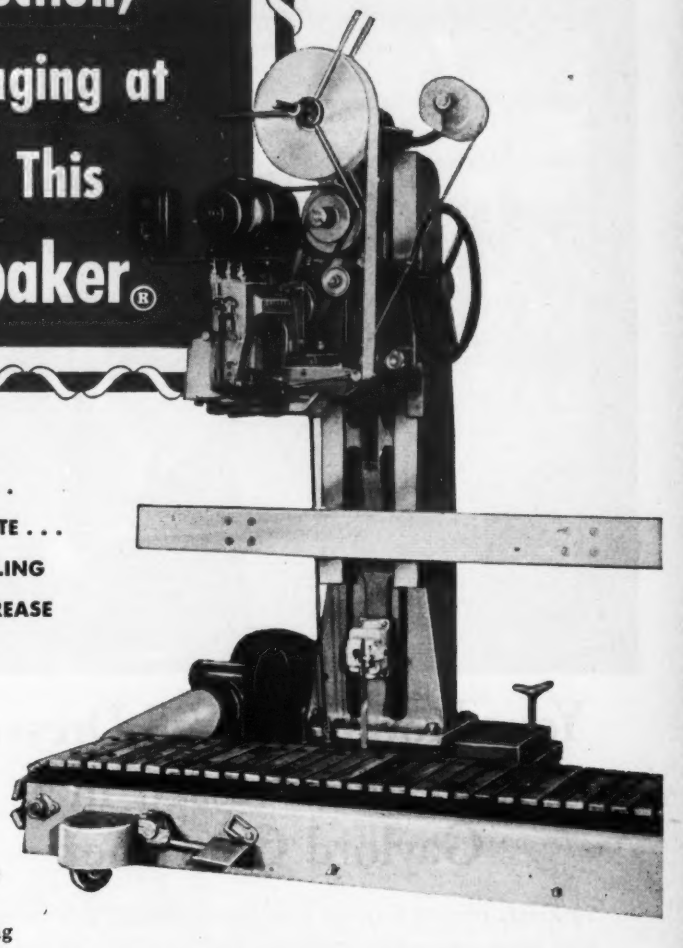
Fills, mixes and sifts powdered and granulated products

Seven specification sheets, including photographs, describing filling and mixing equipment are issued in single folder. Mixing machines, mixing and sifting machines, semi-automatic and automatic loose filling machines and compression filling machines are available.

All units have been designed to permit maximum ease of cleaning and maintenance and the equipment is capable of steady operation with low power consumption.

Specification folder on "Filling, Mixing and Sifting Machines," manufactured by Alite Machines, a British concern, is distributed by US agent for company, Perry Metal Products Co., Inc., Dept. CP, 1127 Atlantic Ave., Brooklyn 16, N. Y. When inquiring reader may simply specify CP 1862 on convenient Reader Service slip between pages two and three.

Get Better Protection, Faster Packaging at Lower Cost With This Model ET Bagpaker®



CLOSES OPEN-MOUTH, MULTIWALL PAPER BAGS SEMI-AUTOMATICALLY . . . TAPES AND SEWS 15 BAGS A MINUTE . . . TEAMS UP WITH YOUR EXISTING FILLING AND WEIGHING EQUIPMENT TO INCREASE PACKAGING EFFICIENCY

You don't have to scrap your present equipment to get *stronger*, more *economical* bag closures with this Model ET Bagpaker. One man—receiving bags from your existing weighing and filling set-up—applies creped *"kraft"* sealing tape over the bag end . . . sews a reinforced "cushion stitch" through both tape and bag . . . and neatly trims tape . . . time 4 seconds or less. Dimensional drawings and detail information are available in Booklet ET-E-12 Write for your copy *today*. Bagpak Division, International Paper Company, 220 East 42nd St., New York 17, N. Y.

Model ET applies famous "Cushion-Stitch" over dry tape for sift-proof closure. Model E-1 applies "Cushion-Stitch" only, for use where sift-proofing is not essential.

Check These Model ET Bagpaker Advantages

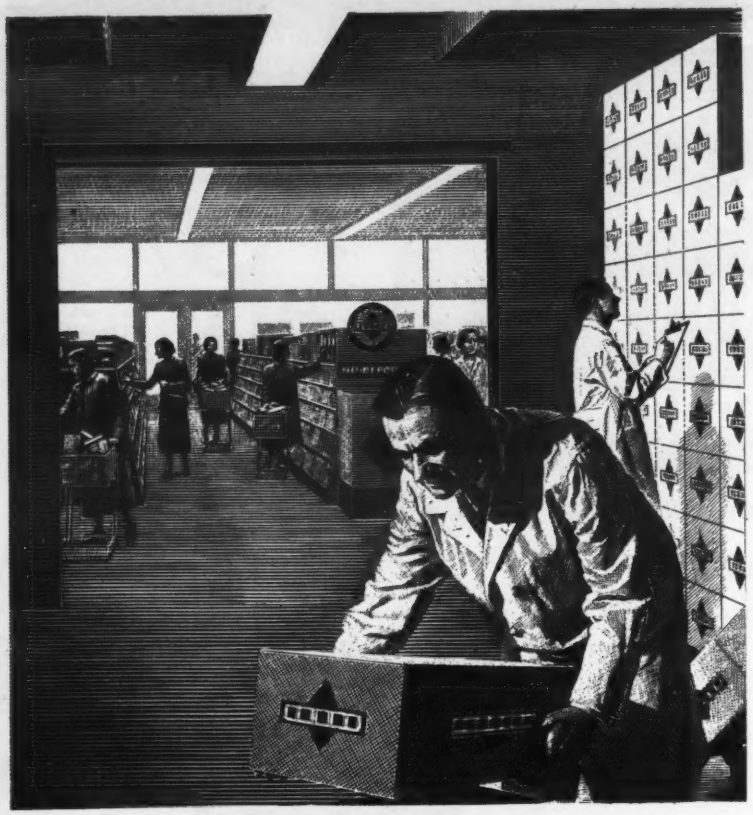
- ★ 15 bags per minute with one operator when filled bags are continuously delivered to conveyor.
- ★ Quickly adjustable for bags of from 25 to 100 lb. capacity.
- ★ Completely portable. Mounted on casters, can be moved easily to various packaging stations.
- ★ Bag starts and stops sewing head when equipped with automatic sewing head control.
- ★ Hoepner No. 150 Heavy Duty sewing unit with automatic brake to prevent "coasting".

International Paper COMPANY

BAGPAK DIVISION

BRANCH OFFICES: Atlanta • Baltimore • Baxter Springs, Kansas • Boston Chicago • Cleveland • Denver • Detroit • Kansas City, Kansas • Los Angeles New Orleans • Philadelphia • Pittsburgh • St. Louis • San Francisco • IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

When inquiring check CP 1863 on handy form, pgs. 2-3



Your Product is Well-Dressed and "Sell-Dressed" in a Gaylord Container

Strikingly printed Gaylord shipping containers keep on selling your name and product wherever they go. This effective and economical medium is a natural to increase the impact of your advertising and other promotions.

Your nearby Gaylord sales representative will be happy to tell you more about these "traveling bill boards." You will find him listed under Boxes (Gaylord) in the classified pages of your phone book.

Gaylord Boxes

Their unseen quality gives you an extra margin of safety.

GAYLORD CONTAINER CORPORATION

General Offices: ST. LOUIS • Sales Offices Coast-to-Coast

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT BAGS AND SACKS • KRAFT PAPER AND SPECIALTIES

Uniform, accurate labeling assured with automatic heat-seal unit . . .

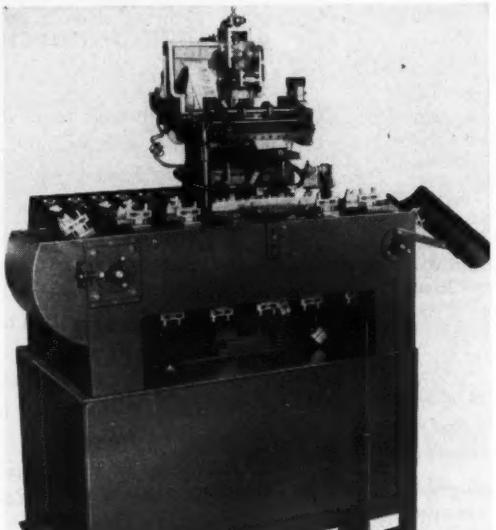
machine will accommodate any job from partial to wrap-around coverage

Uses: For labeling packaged items of various shapes from 5/16" diameter to larger sizes.

Features: Machine assures uniform, accurate labeling using roll labels with a thermoplastic bond. No glue is needed and application is not messy. Labels are said to adhere to practically any surface. Labelers are designed to handle any job from partial to wrap-around coverages.

Description: Labeler can handle labels 1 to 7" wide and 1 to 4" high. It can label up to 60 units per min depending on product and conditions. Automatic model requires floor space of 48 x 30" — semi-automatic model, 24 x 30". Overall height of both models is 60". Drive is variable speed, single phase, 110 v, 60 cycles AC.

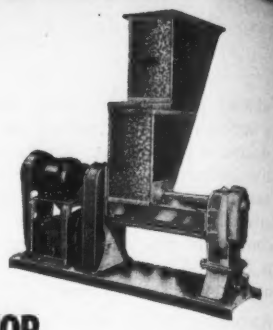
On automatic models, roll labels (printed and delivered by the roll so that copy is provided for one product only) are fed from rear of labeling machine. In one continuous, automatic operation, labels are first coded by a device with a finishing or control number. Labels are then cut off by a



Applies neat uniform labels without need for glue

bar and rest momentarily on two metal arms that heat them to proper temperature for adhering to container. Continuous feed eliminates any chance of a wrong label being used, which is especially important for drugs and pharmaceuticals.

("No-Glu" Labelers are products of Dumatic Industries, Dept. CP, 12th St. below Jefferson, Philadelphia 22, Pa. . . . or for more information check CP 1864 on handy form, pages 2 and 3.)



STOP
Production Choke-ups with a DRAVER FEEDER

You can *stop* choke-ups on production machines by feeding your dry, powdered or granular materials with this efficient machine. No need to run machines under capacity for fear of overloading! Just set a Draver Feeder to regulate the material flow to the unit at the *right* rate for maximum efficient production, and forget it. Even stubborn, non-free flowing products will be fed *uniformly* and continuously. Sifters, dryers, elevators, grinders and others of your production units will be saved undue wear, wasted production time and power, and costly re-processing.

Sturdy, accurate Draver Feeders are made in more than 100 different sizes and models — with capacities from minute quantities up to thousands of pounds per hour. There's sure to be a standard model that will save YOU daily loss of production. Write for our engineers' recommendations and specifications, at no obligation TODAY.

B. F. GUMP CO.,
1344 So. Cicero Ave., Chicago 50, Ill.

Gentlemen: Please send me descriptive literature and complete information on the GUMP-Built Equipment indicated below:

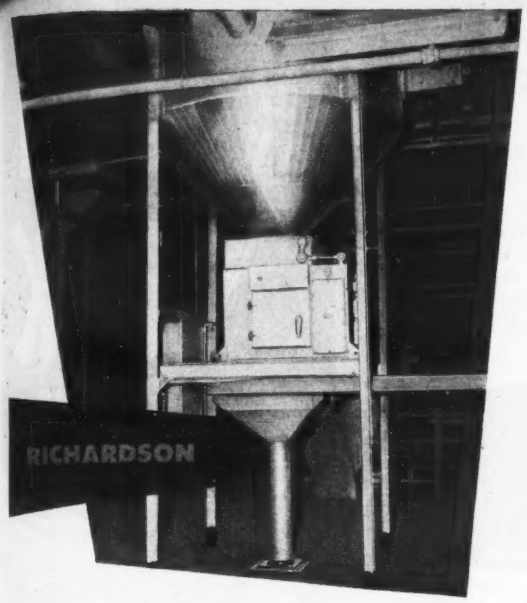
- ☐ BAR-NUN SIFTERS—grade, scalp or sift dry materials.
- ☐ DRAVER FEEDERS—accurate volume percentage feeding.
- ☐ DRAVER Continuous Mixing Systems —accurate, efficient mixing.
- ☐ VIBROX PACKERS—pack dry materials in bags, drums, barrels.
- ☐ NET WEIGHERS—automatic weights range from 3 oz. to 75 lbs.

B. F. Gump Co.

Engineers and Manufacturers Since 1872

Gump 1344 SOUTH CICERO AVE. CHICAGO 50, ILLINOIS

When inquiring check CP 1865 on handy form, pgs. 2-3



PROVIDES SPEED and AUTOMATIC QUALITY CONTROL ...for the MURRAY COMPANY

(Division of H. A. Johnson Co.)

Rising labor costs *can* be offset while still maintaining both quality and quantity production. Proof of this is the Richardson installation pictured, recently completed for the Murray Company, Division of the H. A. Johnson Co., Boston, Mass. Adopting the recommendations of a Richardson field engineer, this well known manufacturer of soda fountain syrups and toppings has actually increased output at reduced unit cost. At the same time product quality is now rigidly controlled, *automatically*.

Materials handling by weight has been a Richardson specialty for more than fifty years. And every year has seen more practical applications throughout the processing industries of this wide range of experience.

PROBLEM:
High labor charges and uncertain accuracies in loading sugar to syrup kettles presented a challenge to the cost- and quality-conscious management of the H. A. Johnson Co.

SOLUTION:
A suitable conveyor system feeding a Richardson Automatic Scale provided high volume, controlled accurate flow of sugar to the cookers. Another alert management had reduced their labor charge to practically nil and incorporated machine-made, repetitive accuracy into their process.

At no obligation to you, a Richardson engineer will gladly call, survey your present methods, and show you the Richardson way to lower costs through efficient materials handling by weight.

Richardson Scale Co., Clifton, New Jersey. Feeder-Weigher Systems of All Types: Automatic Bulk-Weighing Hopper Scales, Including Conveyor-Feed Types • Continuous Feeder-Weighers • Automatic Bagging Scales • Bag Sewing Conveyors • Packers • Process Control Panels. *Branch offices in:* Atlanta • Buffalo • Boston • Chicago • Detroit • Houston • Minneapolis • New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal • Toronto.

Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

When inquiring check CP 1866 on handy form, pgs. 2-3

Drums with polyethylene coating give products added care . . .

allows container re-use, lasts the life of container

Uses: As a protective medium for steel drums in which liquid, paste, and bulk chemicals and foodstuffs are shipped.

Features: Non-porous coating prevents contact of the material being shipped with any part of the metallic container. Since nothing adheres to the coating, the drums may be used over and over again. The firm has set up a special department in which the polyethylene drums can be reconditioned, thus adding life to the coating. The coating can be applied to both used drums that qualify and to new drums supplied by the customer.

Description: The polyethylene coating is completely seamless and is 10 to 15 mils thick on the body and bottom head of the drum. The coating is so applied that it is impossible for any product to touch metal inside the drum.

The coating on the top head of the drum is 20 mils thick to give full protection to vapor or gas corrosion. Present production includes sizes from five to fifty-five gallon and can be suited to full open head or bung-type drum..

Fittings on the bung-type drum can be either black iron or stainless steel, with polyethylene or stainless steel plugs.

Manufacturer points out that although polyethylene coated drums meet Federal specifications and are currently under ICC temporary shipping permits for regulatory products, the coatings are not the answer to every packaging need. A thorough evaluation should be given to the product to be shipped.

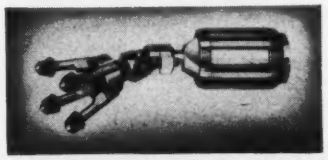
(Polyethylene-coating of drums is done by the Delaware Barrel & Drum Co., Inc., Dept. CP, Wilmington, Del. . . . or for more information check CP 1867 on form, pages 2 and 3.)

Processing & Engineering Data section is located on pages 200, 202, 204, 206

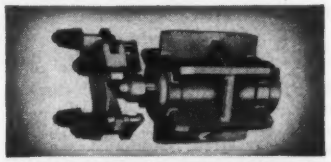
They clean PIPE too!

LAGONDA tube cleaners

● Buyers of used pipe are finding Lagonda tube cleaners just the thing to bring the pipe back to new condition by taking out rust or deposit left in the pipe by former use. New pipe too, needs similar treatment to remove mill scale, sand, or weld sputter from inside surfaces, particularly after the pipe has been packed with sand for bending.



Motor with sleeve, universal coupling and type H-2 head.



Sleeved motor and Quick Repair head for large pipe. Can also be fitted with universal joint for curved sections.

For pipe sizes up to 6 in., standard Lagonda cleaners are used. Above 6 in. the Lagonda 1100 Series motor is sleeved to the pipe size and equipped with suitable Lagonda cutter head. They will clean pipe up to 20 in. inside diameter, straight or curved.

For full details write us, describing the pipe you wish to clean.

Y2-8

ELLIOTT Company

LAGONDA DIVISION • SPRINGFIELD, OHIO

Plants at: Jeannette, Pa. • Ridgway, Pa. • Ampere, N. J. Springfield, O. • Newark, N. J.

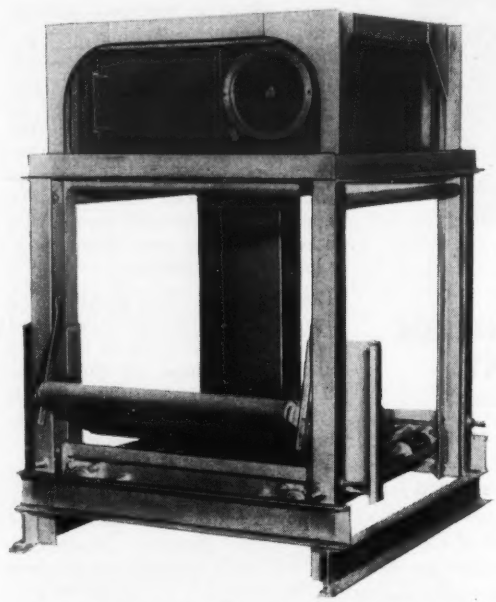
DISTRICT OFFICES IN PRINCIPAL CITIES

When inquiring check CP 1868 on handy form, pgs. 2-3

Off-weight packages rejected automatically by scale . . .

over-weight and under-weight limits established by adjustable tolerance settings

Uses: For checkweighing packages. One way in which scale can be used is in separating properly filled packages from those that are improperly filled by depositing them at opposite ends of the scale. A second method of operation, utilizing the adjustable conveyor rollers located on either



Versatility of checkweighing scale allows it to be used in several different ways

side of the scale, maintains a straight-line flow of the packages. With either method, scale can be pre-adjusted to stop the supply conveyor when improperly filled packages are detected.

Features: Scale automatically indicates the weight of filled containers such as bags, drums, and cartons and then separates the off-weight containers from the properly filled packages. Independently adjustable tolerance settings establish over-weight and under-weight limits. Unit is highly versatile, being capable of being operated in two ways, and being able to meet various applications required.

Description: Model 200S Checkweight Scale consists essentially of an enclosed electromechanical weighing mechanism and a motor driven conveyor belt. Belt on which the containers being checkweighed are conveyed is made of rigidly supported, heavy cadmium plated steel slats and hangs from the scale platform. Sufficient clearance is allowed between conveyor bed and the scale to allow free passage of the packages during the operation.

Should broken bags or cartons pass over the conveyor, the loose material coming from them will

This NEW METHOD DRIES AIR

PRECISELY as you want it

- to control your product's quality
- to prevent condensation on your product or material
- to prevent changes due to moist air in contact with your product
- to protect your material from dampness
- to protect your processing of moisture-sensitive material
- to DRY your material or product
- to pack or store your product safe from moisture damage
- to get exact moisture control for the precise atmosphere condition you need
- to provide precise atmospheric conditions for testing
- to increase your air conditioning capacity
- to DRY large quantities of fresh air from outdoors

The Niagara's Controlled Humidity Method using HYGROL moisture-absorbent liquid is

Best and most effective because . . . it removes moisture as a separate function from cooling or heating and so gives a precise result constantly and always. Niagara machines using liquid contact means of drying air have given over 20 years of service.

Most reliable because . . . the absorbent is continuously reconcentrated automatically. No moisture-sensitive instruments are required to control your conditions.

Most flexible because . . . you can obtain any condition at will and hold it as long as you wish in either continuous production, testing or storage.

Easiest to take care of because . . . the apparatus is simple, parts are accessible, controls are trustworthy.

Most compact, taking less space for installation.

Inexpensive to operate because . . . no re-heat is needed to obtain the relative humidity you wish in normal temperature ranges and frequently no refrigeration is used to remove moisture.

The cleanest because . . . no solids, salts or solutions of solids are used and there are no corrosive or reactive substances.

Niagara Controlled Humidity Air Conditioning

This method removes moisture from air by contact with a liquid in a small spray chamber. The liquid spray contact temperature and the absorbent concentration, factors that are easily and positively controlled, determine exactly the amount of moisture remaining in the leaving air. Heating or cooling is done as a separate function.

For complete information write

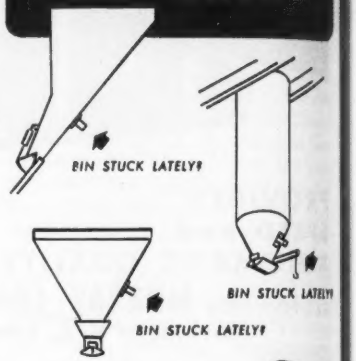
NIAGARA BLOWER COMPANY

Dept. CP, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities of United States and Canada

When inquiring check CP 1869 on handy form, pgs. 2-3

BIN STUCK LATELY?



Is your production slowed down by troublesome arching, bridging and sticking of dry materials in bins and hoppers? Relax! Just order a CLEVELAND vibrator to eliminate the trouble instantly and economically.

Both quiet air conditioned and standard metallic impact types.

CATALOG 105

THE CLEVELAND VIBRATOR COMPANY

2706 Clinton Ave. • Cleveland 13, Ohio

When inquiring check CP 1870 on handy form, pgs. 2-3

fall through the slats to the floor beneath without altering the tare weight of the scale. Conveyor can also be mounted as close as eight inches from the floor.

Dial indicator located on the scale shows the amount each package is overweight or underweight. Additional indicators may be installed at remote control stations. For added control, a horn within the scale sounds as each off-weight package is discharged. Colored signal lights may also be furnished for indicating the weight classification of each package.

While scale can be used as a control on shipments, it also serves as an effective means of controlling package filling equipment. Operators of filling machines, guided by trend of weights shown on the checkweigher, may adjust the filling scale before any discrepancies begin to fall outside of the acceptable limits.

Automatic weight control mechanism is available for attaching to existing filling scales. Connected electrically to the checkweight scale, this mechanism is activated when a package passes over the checkweight scale. If package varies two ounces or more from the prescribed weight, filling scale output is automatically adjusted by one ounce or larger preset increments.

Additional optional equipment for scale includes an electrically operated reset counter to tally the packages of various classifications. A recorder can also be furnished to print a record of the weight of each package checkweighed.

Another checkweighing scale, the Model 200; has the same performance specifications as the Model 200S, except the conveyor is mounted at the top of the scale platform. In addition to this model, custom built checkweighing and weight classifying scales are furnished for special applications of this equipment.

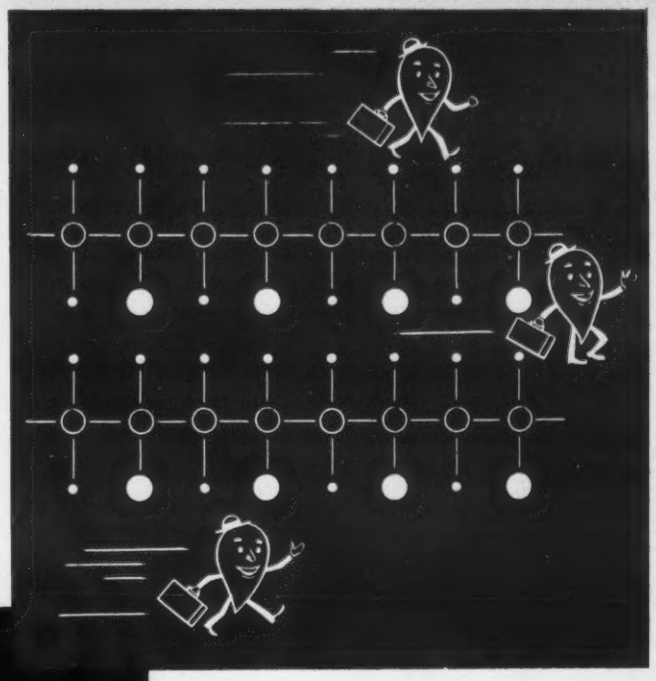
(Product of Thayer Scale and Engineering Corp., Dept. CP, East Water St., Rockland, Mass. . . . or for more information check CP 1871 on handy form, pages 2 and 3.)

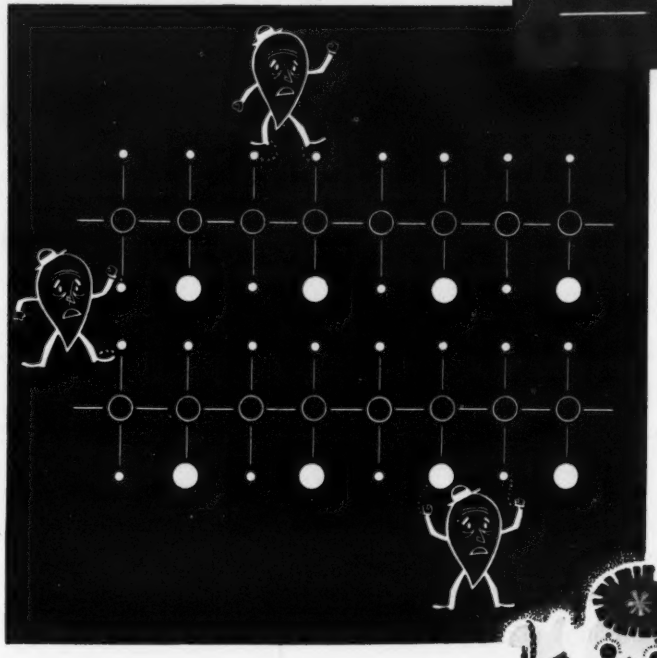
Tablets, troches, and capsules handled by counter

Automatic and semi-automatic machines for counting tablets, troches, and capsules are presented in 4-page folder. Production specifications and features are given along with drawings explaining the counting principle. Fully automatic machine will handle bottles ranging from ½ to 2¼" in diameter. Semi-automatic machine will accommodate larger size bottles. Production speeds depend on count per bottle and size of article being packaged. Rate ranges from 30 to 200 bottles per minute depending on machine and product.

Folder on Count-All Counter is available from Merrill Machinery Sales Co., Dept. CP, 4458 W. Madison St., Chicago 24, Ill. When inquiring specify CP 1872 on handy form, between pages two and three.

Plasticizers can't migrate...





We lock 'em in!

Internally Plasticized Copolymers of Vinyl Acetate give films that are *permanently flexible*. Plasticizer is locked in by a chemical bond. Can't escape even if heated for days. In addition to permanent flexibility you get—Very good adhesion • Excellent light stability • Good film clarity and film continuity • Greaseproofness • Ease of application • Compatibility with many other chemicals • Supplied in solution, emulsion or hot melt form.

SUGGESTED USES

- Heat-seal and solvent-reactivating coatings
- Adhesives for transparent sheetings, foils, varnished papers, inked papers, and other difficult surfaces
- Greaseproof and asphaltproof coatings
- High-solids emulsions and lacquers
- Binders for paper, fibers, cork, asbestos, etc.
- Sizes and binders for textiles and carpets

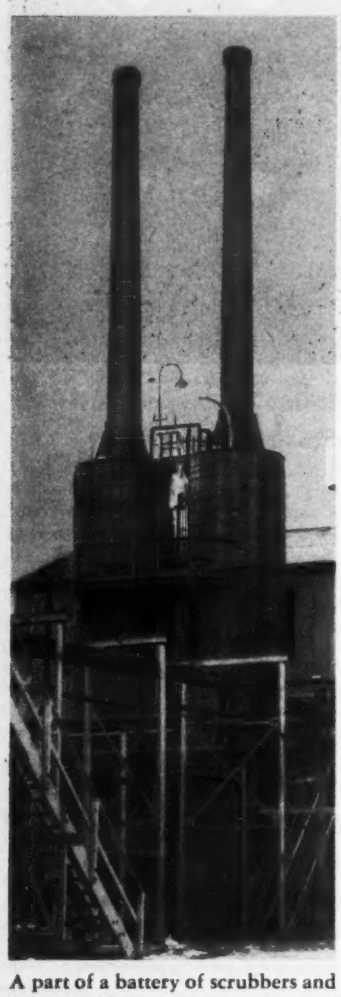
. . . or National will tailor-make a Vinyl Acetate copolymer for *your* specific use.

RESYNS®
National ADHESIVES
270 Madison Avenue, New York 16, N. Y.

When inquiring check CP 1873 on handy form, pgs. 2-3

INDUSTRY NEWS IN BRIEF . . .

SANTA FE TANK & TOWER COMPANY OFFERS A SPECIALIZED ENGINEERING SERVICE



A part of a battery of scrubbers and fume stacks in a large chemical plant to remove acid fumes and recover by-products.

Los Angeles, California...Throughout the nation a problem exists... the removal of acid fumes and dust that is emitted from many industrial plants. Engineering firms are constantly being asked to design processes for their removal or recovery.

The Santa Fe Tank & Tower Company, specialists in the field of structural design, fabrication and installation of these units, is cooperating with basic engineering companies to help to effectively cope with this problem.

An example of cooperative endeavor is illustrated here by a chemical plant project directed by The Ralph M. Parsons Company. The Santa Fe Tank & Tower Company cooperated with this internationally known engineering firm in determining the proper materials to be used... and to structurally design, fabricate and erect this battery of scrubbers. As a result of this cooperative effort, the ultimate customer, as well as the community surrounding the plant, was best served.

Serving practically all industries, the Santa Fe Tank & Tower Company is probably the most dependable source for these specialized washer installations. Santa Fe offers this specialized service to engineers.

Santa Fe maintains branch offices in all principal cities. For complete information and engineering data on Wood Pipe, Wood Tanks, Cylindrical Gas Scrubbers, Cooling Towers, and other wood specialties, write to Santa Fe Tank & Tower Company, 5401 So. Boyle Avenue, Los Angeles 58, California.

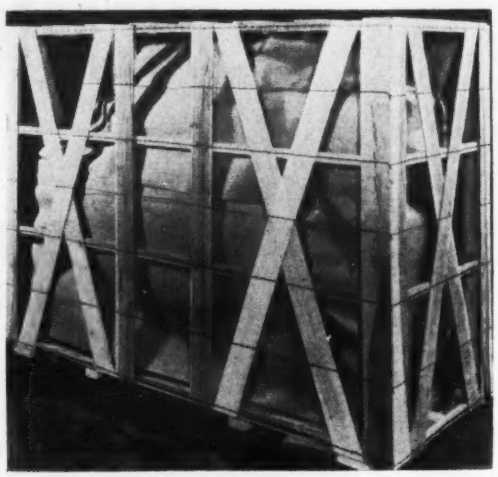
When inquiring check CP 1874 on handy form, pgs. 2-3

PACKAGING

King size available in heavy-duty wirebound containers for shippers of large, weighty items . . .

designed to carry equipment weighing up to 3000 pounds

Fairly large, weighty items, heretofore requiring costly, hand-made nailed-wood crates, can be handled by a king size wirebound container, according to manufacturer. Considered as near top-limit capacity practical for wirebounds is this container which is designed to carry equipment weighing 3000



Container weighs 35 lb less than nailed-wood crate

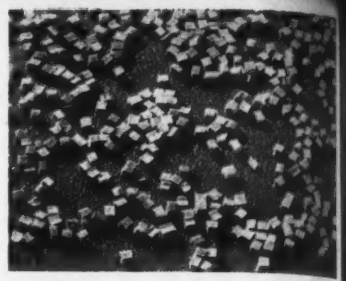
lb. Container measures 63 x 93 x 39", and weighs 35 lb less than former nailed-wood crate. Each lot of 100 is said to save 3100 lb of shipping weight, spare the shipper all the trouble of making his own crates in quantity, and simplify packaging. (Product of The American Box Co., Dept. CP, 1900 W. 3rd St., Cleveland, Ohio . . . or for more information check CP 1875 on handy form, pgs. 2-3.)

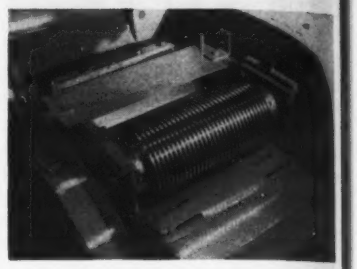
Detects metal contamination in packaged products

Four-page, 2-color bulletin describes electronic device used to detect metal contamination in products which have been packaged in cartons, boxes, bags, and like containers. Detectors can be equipped to inspect finished, sealed packages (ideal application for unit, since further contamination is not possible).

Unit is completely automatic and has separate power supply. An integral relay is connected externally for operating any device required such as a gate mechanism, a bell, or a motor control. Bulletin contains complete specifications, illustrations, and suggested applications for units.

Bul on Electronic Metal Detector is issued by E. W. Brilmayer Laboratories, Inc., Dept. CP, 86 Fulton St., New York 38, N. Y. When inquiring specify CP 1876, pgs. 2 & 3.





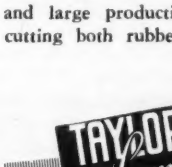
PELLETIZE

RUBBER OR PLASTIC STOCK —

in preparing it for extrusion or molding, with—

TAYLOR-STILES DICING CUTTER

In a single operation, this efficient machine takes sheets of stock and cuts them twice: 1) With rotary cutters that slice the sheets into strips—2) the knives on a revolving knife head which cuts the strips into small cubes of uniform size.



SEND FOR FREE COPY OF FOLDER App. 202

which describes Taylor-Stiles precision and large production cutters used for cutting both rubber and plastic stocks.

TAYLOR-STILES and Company
CUTTING MACHINES & KNIVES

20 Bridge Street
Riegelsville, New Jersey

When inquiring check CP 1877 on handy form, pgs. 2-3

Strong vinyl film liners permit packaging in paper boxes . . .

lowers container costs and saves shelf space

Uses: At present the films are being used for bulk packaging of sulfanilamide, cod liver oil, cough drops, hair shampoo, face creams, and a variety of food products such as lard and pickle relish.

Features: High tensile strength of the vinyl films enables a number of products to be packaged in paper boxes with liners. This eliminates the need for less economical containers and saves shelf space.

Description: Two types of films are being used for the liners, K-flex BV and K-flex DV, the first being made from Geon polyblend and the second from straight Geon vinyl resins. These materials were developed so that fats and oils will not migrate through the films or impart odors to the enclosed goods.

Liners formed from the films are tailored to conform to the inside walls of any shape box, drum, or receptacle. They will carry liquids or semi-solids as well as solids. The pre-formed liners have no wrinkles, folds, or pockets. Materials are not wasted in folds of surplus liner upon removal. After a container is filled, the liner is mechanically, thermally, or electronically sealed.

Geon polyblend, one of the ingredients of the BV film is polyvinyl chloride plasticized with Hycar nitrile rubber.

Plasticizer eliminates, in the majority of cases, the need for a liquid-type plasticizer with the accompanying difficulties of volatility and migration.

(R. L. Kuss and Co., Inc., Dept. CP, Findlay, Ohio are marketing liners made from vinyl films, which are product of B. F. Goodrich Chemical Co., Dept. CP, 324 Rose Bldg., Cleveland 15, Ohio . . . or reader may secure more information by simply checking CP 1878 on handy Reader Service slip, pages two and three.)

For more information on product at right, specify CP 1879 . . . see information request blank between pages 2 - 3.

Her fingertips imagine the taste

The lady doesn't trust her eyes alone.

The buyer of Multiwalls is in much the same position.

Aside from package design, it's hard to tell one manufacturer's bag from another's simply by looking at it or fingering it.

Put the bags out of sight and you may be able to see many differences.

Men who buy 85 per cent of all Multiwalls consider* these intangibles more important than any other factor when they choose their supplier.

Invariably, these are among the first questions they ask . . .

"Is this company big enough?"

"Do they have a fair allocation policy?"

"Are their prices competitive?"

"Do they respect delivery dates?"

In a nutshell—

"Are they good people to do business with?"

We can't tell you what the answers are when these Multiwall users consider Union. This we do know . . . and the inference is yours to make—

In these days of industrial pressure, when *dependability* is a fervent wish as well as a word, men to whom Multiwalls are important are placing an increasing share of their orders with Union.

More so every day . . .

IT'S UNION FOR MULTIWALLS

TRADE MARK UNION

**August, 1951 research study.*

UNION BAG & PAPER CORPORATION • NEW YORK: WOOLWORTH BUILDING • CHICAGO: DAILY NEWS BUILDING

SLY PIONEERS and LEADERS in INDUSTRIAL DUST CONTROL

Sly Economy Dust Filter — one of a complete line.

You, too, may have a dust condition which could be corrected by a modest investment — and yield gratifying returns.

A well known producer of antibiotics uses this Sly Economy Dust Filter for the complete collection of dust out of 750 cubic feet per minute of air from a processing operation and the "dust" has a value of $40 per pound. Although the concentration of this dust in the air is low—only 1/10 grain per cu. ft.—it amounts to 5 pounds per 8 hour day. Thus, every week the filter repays it cost.

Your dust may not be as valuable, but the concentration in the air may be much greater. Even if the dust has no value at all, its collection means better working conditions, improved production, and reduced maintenance.

Regardless of what you make, if you have a dust problem our long experience in collecting all kinds of dusts can be of value to you in cleaning up the plant and effecting savings. May we send you Bulletin 98, full of helpful information on dust control?

THE W. W. SLY MANUFACTURING CO.

4754 TRAIN AVENUE • CLEVELAND 2, OHIO

New York • Chicago • Philadelphia • Syracuse • Detroit • Buffalo
Cincinnati • St. Louis • Minneapolis • Birmingham • Los Angeles • Toronto

When inquiring check CP 1880 on handy form, pgs. 2-3

PACKAGING

Fragile merchandise protected during shipment

Uses: As a packing material for protection of products during shipment and handling.

Features: When poured in carboys or crates around fragile merchandise such as bottled chemicals or pharmaceuticals, material forms a protective barrier that absorbs shock and reduces breakage. Each granule of this material is resilient because it has its own built-in shock absorbers. These are tiny air cells, formed during the processing of this mineral when it is exposed to intense heat.

Description: This versatile material, which is used also as a concrete aggregate and an insulation, is a granular mineral of the mica class. It is lightweight, resilient, fire-proof, clean, and absorbent. It is said to have proved particularly useful in shipments of liquids in glass containers. If a bottle or jug should break, the material absorbs the liquid and frequently prevents leakage from the crate.

Because of its granular form, material can be poured around packaged products, saving handling time. Packaging may be done on conveyor systems, with material placed over belt in large hoppers, from which measured amounts will flow automatically into each container.

(Vermiculite is a product of Zonolite Company, Department CP, 105 S. La Salle Street, Chicago, Illinois . . . or for more information reader may simply check CP 1881 on handy Reader Service slip, pages two and three.)

Small bottles, gal jugs labeled with equal ease by unit

Uses: For labeling various sized bottles or jugs.

Features: Machine will label a gallon jug or a 4 oz bottle with equal facility. Size change is made in a few minutes by simple adjustments. Odd-shaped bottles or containers with recessed surfaces are said to pose no problem. A flexible pressure device presses

NOW you can have METERED IDENTIFICATION for formula, inventory and cost controls

STAINLESS STEEL METER
Inside and Out

STOPS CORROSION PROBLEMS HANDLING FOODS, PHARMACEUTICALS, CHEMICALS, OTHER LIQUIDS

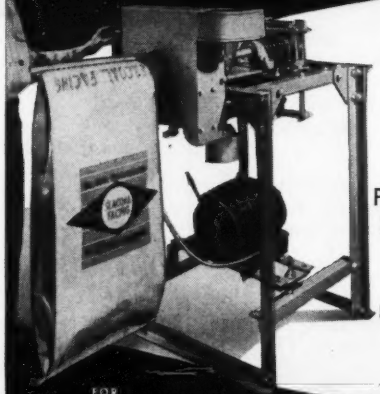
This new Rockwell Type 2BC Rotocycle meter is of all-stainless steel construction; corrosion-resistant, easy to clean. It provides accurate records of quantities of liquids handled which are so important in quality control, scheduling, cost accounting and tax analyses. Quantity Control Registers and Remote Registration Systems are available. Described in Bulletin OG-403. *Write Rockwell Mfg. Co., Dept.* A3, Pittsburgh 8, Pa.

You Can RELY ON ROCKWELL INDUSTRIAL METERS

When inquiring check CP 1882 on handy form, pgs. 2-3

Investigate the 1953 BLACK DIAMOND AUTOMATIC

valve bag packer



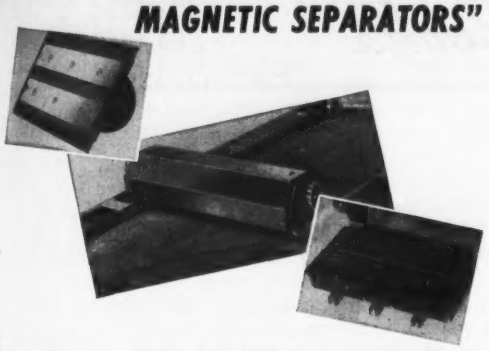
Designed to pack dry granular or powdered free-flowing materials
★
Push-button control
Moderately priced
Easy to install
Lowest maintenance costs
Performance guaranteed
★

FOR FURTHER INFORMATION WRITE BLACK PRODUCTS COMPANY TO 13513 S. CALUMET AVE. • CHICAGO 27, ILL.

MANUFACTURERS SINCE 1912

When inquiring check CP 1883 on handy form, pgs. 2-3

"TELL 'EM ABOUT OUR OTHER *MAGNETIC SEPARATORS*"



Said the boss: "Folks will think from our ads that the grate is the only magnetic separator we make. Tell 'em about the others."

So we're illustrating our Triple-Air-Gap and Single-Air-Gap chute models and our Portable model.

The air gaps in the chute models are troughed. Rolling pieces of steel, such as nuts and ball bearings, drop into the recesses. There they are stopped dead by magnetic force.

Iron and steel pieces hop out of flowing materials to impinge upon the Portable Magnet mounted over a picking table or belt.

The Magnetic Grate is placed in a hopper bottom or floor opening to catch the tramp iron in dumped or shoveled material.

Get all the details in Bulletin M-3-A

THE BAUER BROS. CO.

1728 SHERIDAN AVE. • SPRINGFIELD, OHIO

When inquiring check CP 1884 on handy form, pgs. 2-3

quick to stick no need to lick!

AVERY Kum-Kleen self-adhesive **LABELS**

THE EASIEST AND MOST ECONOMICAL LABEL YOU CAN USE!

- TRADEMARKS
- INSTRUCTIONS
- GUARANTEES
- "BUY" FEATURES
- NAMEPLATES
- WARNING
- DIAGRAMS
- INSPECTION
- APPROVAL SEALS
- PRICES

SAVE YOU TIME - MONEY!

An Avery label specialist will gladly explain how you can use Kum-Kleen pressure-sensitive labels profitably in YOUR business. Mail the coupon now for complete facts.

PATENTED AVERY ELECTRIC DISPENSER

AVERY ADHESIVE LABEL CORPORATION

117 Liberty St., New York 6 • 1616 S. California Ave., Monrovia, Cal.
608 S. Dearborn St., Chicago 5 • Offices in other principal cities

☐ Please send case histories and samples
☐ Tell us about your electric label dispenser
☐ Have the local Avery man call

Name
Title
Company
Address

When inquiring check CP 1885 on handy form, pgs. 2-3

the labels down after they have been applied. A firm, strong seal is assured — even if container is hot, cold, wet, or dry, according to manufacturer.

Description: This is a continuous motion, straight-line machine that has a speed of up to 120 containers a minute. It may be hooked up to the filling and capping line, or be fed by hand.

Bottles are conveyed to machine standing upright, and as they enter the chain-infeed conveyor, they are gently rolled on their sides, in which position labels are applied.

Labels are fed individually from a stack, automatically glued and applied to containers. Labels then pass under flexible compression units and pressure is applied for two cycles of the machine, thus insuring a firm seal. Practically any type of glue can be used with satisfactory results, and thermoplastic or hot-melt adhesive can be used by merely equipping gluepot with heaters.

Machine will accommodate almost any type of label — rectangular, round, or fancy cut; in paper, foil, glassine, and like materials. Gummed and embossed labels may also be used. Any weight of stock is satisfactory, provided material will hold a vacuum. Grain and cut of labels is not too important, according to manufacturer.

(Product of Package Machinery Co., Dept. CP, East Longmeadow P.O., Springfield, Mass. . . . check CP 1886 on form, pages 2 and 3.)

Wrong weight packages rejected by robot unit

Fully automatic weighing unit, which check weighs every container removing any not meeting pre-set tolerances, is briefly described in 2-page bulletin. Unit is operated on 110 v, 60 cycle current. Reported accuracy is 1/30 oz at container speeds of approx 100/min.

Bul on Robot Check Weigher is issued by Illumi Tronic Engineering Co., Dept. CP, 680 E. Taylor Ave., Sunnyvale, Calif. When inquiring specify CP 1887 on handy form, pages 2 and 3.

USE Bemis Waterproof Laminated-Textile Bags

FOR YOUR HARD-TO-PACK PRODUCTS

GET 5-WAY PROTECTION

...they guard against:

- Change of moisture content
- Sifting
- Escape of undesirable odors
- Loss from snagging and tearing
- Rough handling in l. c. l., truck or export shipment

3- or 5-layer construction depending on your protection requirements. Special linings of treated papers and films available.

Bemis

408 Pine St., Box 92
St. Louis 2, Mo.

Maybe You Need These, Too

If you don't require the exceptional protection of Bemis Waterproof Bags, Bemis Multiwall, Flexiply (laminated crinkled multiwall), Cotton or Burlap Bags are your best bet.

Whatever Kind of Bag You Need, WE MAKE IT!

When inquiring check CP 1888 on handy form, pgs. 2-3

now

FLEXIBLE STANDARDS for Pfaudler

Stainless Steel Heat Exchangers

Design features previously associated only with custom-built heat exchangers are now available at competitive standard cost under Pfaudler's new system of flexible standards.

For a given heat transfer area, you may select the most applicable combination of length and diameter. Further, nozzles can be of any size and in any position and can be either threaded or flanged.

RAPID DELIVERY — With our new production line methods, flexible standard units can be delivered in 4 to 12 weeks after receipt of your order.

COMPLETE LINE — The flexible standard program applies to fixed tube sheet, single or multi-pass, tube and/or shell side stainless steel units in diameters up to 10". In addition, Pfaudler heat exchangers are available with shell diameters from 4" to 24" in four basic types of construction . . . fixed tube sheet condenser, outside packed floating head design with removable tube bundle and shell, "U" tube construction with removable bundle.

GET THIS PFAUDLER DATA BOOK — This 40-page fact-packed heat exchanger manual contains all the data you need to work out capacity and type problems. Easy-to-follow tables, curves and charts. Full details on Pfaudler heat exchangers. Mail the coupon for your copy.

Pfaudler

ENGINEERS AND FABRICATORS OF CORROSION RESISTANT PROCESS EQUIPMENT

GLASSED STEEL—Hastelloy • Aluminum • Tantalum • Teflon Carbon Steel • Solid or Clad Stainless Steel • Nickel • Inconel • Monel

THE PFAUDLER CO., Dept. CP-6, Rochester 3, N. Y.

Please send me the Pfaudler Heat Exchanger Manual No. 837

Name .....

Title .....

Company .....

Address .....

City ..... Zone ..... State .....

When inquiring check CP 1889 on handy form, pgs. 2-3

Recent Books

INORGANIC CHROMATOGRAPHY

Reviewed by F. L. Boys

Sinclair Research Laboratories, Inc., Harvey, Ill.

The presentation of this 134-page book by Orsino C. Smith aids the inorganic chemist interested in chromatographic analysis, or separations, by providing a ready source of abstracts to the various papers pertinent to the subject.

The major portion of this work is devoted to reviewing the early work of Tswett in developing the chromatographic procedure, and the developments resulting in column, paper, and ion exchange separations. The remaining section is devoted to the methods attempted and results achieved by the author while endeavoring to apply column chromatography to practical inorganic analysis.

Integrating a series of abstracts into book form is doubtless a difficult task, and in this case has resulted in a random arrangement of subject matter and poor continuity of thought. These faults have been ameliorated by inclusion of a comprehensive index. The reviewer recommends the book as a history of this phase of chemistry, as well as a convenient starting point in beginning a literature survey of the experimental aspects of inorganic adsorption processes.

To obtain "Inorganic Chromatography" remit $5 *direct to D. Van Nostrand Co., Inc., Dept. CP,* 250 *Fourth Ave., New York* 3, *N. Y. When inquiring specify CP* 1890 *on handy form, pages* 2 *and* 3.

APPLIED INORGANIC ANALYSIS

Reviewed by G. L. Clark

Prof. of Chemistry, Head, Analytical Division

Dept. of Chemistry and Chemical Engineering

University of Illinois

Just as the Bible and Shakespeare are towering classics in the field of literature, so in all other areas of knowledge we find books which through the years rate as enduring classics. This is certainly true in the field of analytical chemistry for the second edition of this masterly contribution to the subject, originally published in 1929 by the eminent authorities from the National Bureau of Standards, W. F. Hillebrand and G. E. F. Lundell. With characteristically meticulous care, following the death of the former, Dr. Lundell began in the late thirties the revision which, after his death, was finally finished by their well qualified younger associates, H. A. Bright and J. I. Hoffman. For twenty-five years, "Hillebrand and "Lundell" have been the final authority in the field of classical analysis, and this new edition brings this subject that never grows old up to date.

Part I, General Considerations, discusses balances and weights, apparatus and reagents, common operations, special operations and techniques, and volumetric analysis. Part II is devoted to the determination of the chemical elements; Part III, silicate rock analysis and Part IV, rock carbonate analysis.

The greatest problem facing the revisers was the matter of introduction of instrumental techniques which have come forward so insistently since the first edition. In order to keep this volume of 1034 pages from becoming unwieldy, these instrumental methods are mentioned and recommended at various places throughout the book, but are never described in detail. The authors state they "may be pardoned for this ommission when it is realized that this is not a book of special techniques, but one devoted primarily to separations and reactions that are fundamental in analytical chemistry."

It is evident that this self-renewing classic is an essential part of the equipment of any analytical chemist for in a sense it is an encyclopedia, but with a unity and logic which ties every phase of the subject into the central whole.

Consistent with the very essence of accuracy, the publishers, John Wiley and Sons, have done what appears to be a perfect job of producing this book.

To obtain "Applied Inorganic Analysis" remit $15 *direct to John Wiley & Sons, Inc., Dept. CP,* 440 *Fourth Ave., New York* 16, *N. Y. When inquiring specify CP* 1891 *on handy form, pages* 2 *and* 3.

CELLULOSE — THE CHEMICAL THAT GROWS

Reviewed by G. A. Richter

Wood Cellulose Development Div.

Eastman Kodak Company

Rochester, N. Y.

Cellulose — the Chemical That Grows, is a stimulating tale of the exciting things that have been done with one of nature's most prolific and important products. Written by William G. Haynes, it spans 386 pages of material including a fine cellulose glossary and up-to-date appendices.

This colorful account of personal achievement and of the men who have been responsible for the great industrial family of cellulose derivatives has been gleaned from many sources. As is to be expected in a tale of this sort, some exaggeration is used to emphasize a point and in some instances the *dramatis personae* have been a bit overdrawn.

In practically all cases, however, the important topics are portrayed in authentic manner even though in their reading the reader sometimes feels that he is cascading over a lively stream in zigzag fashion to reach an ultimate objective.

The story of woodpulp, rayons, plastics, and lacquers is treated in excellent manner, and the book should prove of interest to those who have some connection with the vast cellulose industry. Some 45 illustrations are used to implement the textual matter along with various sketches and drawings.

To obtain "Cellulose" remit $4 *direct to Doubleday & Company, Inc., Dept. CP,* 575 *Madison Ave., New York* 22, *N. Y. When inquiring specify CP* 1892 *on handy form, pages* 2 *and* 3.

SOLUBLE SILICATES VOL II

Reviewed by George L. Kalousek
Research Division Owens-Illinois Glass Company, Toledo, Ohio

Soluble Silicates, Vol II, by James G. Vail is a comprehensive 669-page treatise on the industrial uses of soluble silicates and represents a complete and expanded re-write of the 1928 edition of the Chemican Monograph on the same subject matter. Vol I of the two volume treatise presents the theoretical aspects of soluble silicates.

The extraordinarily wide application of soluble silicates, touching nearly every walk of life, makes this book a valuable addition to technical literature in general. Commercial applications of soluble silicates are stressed, but the principles involved are concisely emphasized. Reference is made freely to a great number of patents which in itself reflects the commercial importance of the subject.

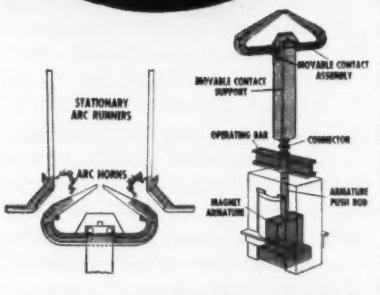
The division of the volume into four principal parts — Interfaces Modified (detergents, metal cleaning, etc), New Surfaces (protective coatings, etc), Bonded Surfaces (adhesives, etc), and Sols, Gels and Polymers (catalysts, etc) — represent a logical grouping of the large number of applications of soluble silicates. The principles and properties are covered in essential details but in no instance does the author resort to highly technical terminology or unnecessary mathematical treatment. The author's enthusiasm for the successful industrial uses of soluble silicates is manifested time and again by photographs of "before" and "after" treatment and tends to give the book a slight, but not unfavorable, taste of sales promotion.

The excellent printing, abundant figures with concise and easy to follow captions, and a fluid style of writing will make this book popular with both technical and non-technical readers in the fields of soluble silicates. Vol II contains a complete index to both volumes.

To obtain "Soluble Silicates Vol II" remit $15 *direct to Reinhold Publishing Corp., Dept. CP,* 330 *W. 42nd St., New York* 36, *N. Y. When inquiring specify CP* 1893 *on handy form, pages* 2 *and* 3.

TYPE 256 Air Contactors

CUT Maintenance Cost



Double-break contacts, vertical action, dual blowout structure and other features speed arc extinction . . . assure long life and low maintenance.

IF YOUR OPERATION demands frequent starting, inching, reversing or plugging . . . if rough repetitive duty plays havoc with contacts and sends maintenance costs skyrocketing . . . you need the Allis-Chalmers Type 256 Air Contactor.

No Turning Shafts — No Shaft Bearings

The elimination of turning shafts, shaft bearings and flexible contact leads minimizes mechanical wear. Double-break contacts of arc resistant alloys, *operating in air,* straightline vertical action and fast arc extinction add months of contact wear. Actual case histories of "once-a-minute interruption" duty have revealed little contact wear in a full year's operation.

Replacement Units

Compact design permits installation in a cubicle used for oil immersed units in existing starters. And, of course, the Type 256 Air Contactor is also available in Allis-Chalmers Type H Starters.

Call your nearby A-C representative or write for Bulletins 14B7303 and 14B6410. Allis-Chalmers, Milwaukee 1, Wisconsin.

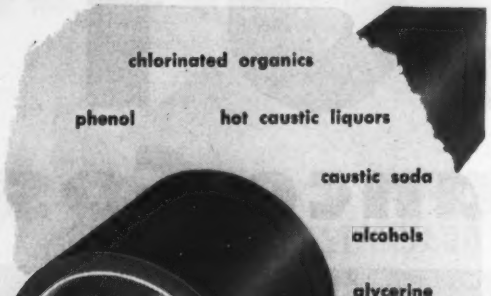
A-3945

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

When inquiring check CP 1894 on handy form, pgs. 2-3

NOW!
Low Cost Corrosion Control



Uniform, pore free nickel deposit fully adherent to the steel pipe.

LECTRO-CLAD

NICKEL-PLATED SEAMLESS

Pipes - Tubings - Fittings

The exclusive time-tested **BART LECTRO-CLAD PROCESS** electrolytically deposits a corrosion resistant nickel lining on the interior surface of steel pipe from 1½" to 24" diameter and in 20-foot random lengths.

Saves critical nickel, is readily available, and is priced competitively.

LECTRO-CLAD is the answer to corrosion and contamination problems in the conveying of highly corrosive materials . . . and the cost is surprisingly modest.

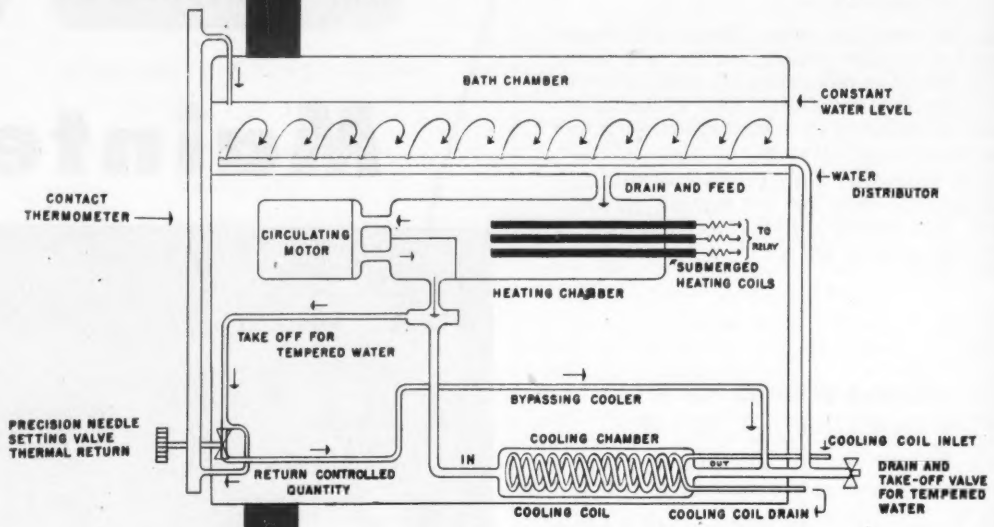
Write Dept. P-6 today for complete details and technical data. Names of large users of LECTRO-CLAD available on request.

BART MANUFACTURING CORP.
229 Main Street Belleville 9, New Jersey

Exclusive territories available to qualified distribution organizations.

When inquiring check CP 1895 on handy form, pgs. 2-3

for the laboratory



Incorporated into bath design to produce temperature constancy, combination heating and cooling system is pictured in schematic diagram. Arrows indicate direction of flow of bath liquid

Manometric apparatus features reproducible shaking speed, shaking amplitude, temp

USES: In precision manometric measurements of reaction rates for special chemical and kinetic reactions. Also useful — in special models — for photosynthetic quantum reactions.

Features: Not only are shaking speed, shaking amplitude and temperature automatically controlled, but completely reproducible.

Description: Bronwill Models US and USL, rectangular units, provide for temperature constancy of plus or minus 0.005°C; circular models, UV and UVL, for temperature constancy of plus or minus 0.01°C. Models USL and UVL are equipped for photosynthetic quantum reactions with lights focusable on each individual reaction vessel. Exchangeable lights for several spectral ranges are available.

The thermal system is controlled by an adjustable contact thermometer operating through an electronic relay and permitting a constancy of plus or minus 0.005°C (Models US and USL) corresponding to a pressure variation in the reaction vessels of only 0.01 mm column of water. Thermometer scale is graduated from 25 to 45°C in 0.05°. Combination of heating and cooling is employed to produce the temperature constancy. Incorporated in the apparatus are both a heating and a cooling chamber. This design allows continuous removal of heat from the circulating water so as to achieve close temperature control of the bath even when operating at temperatures which are barely above room conditions.

Each manometer unit can be individually arrested or re-started. Each bank of seven manometers is separately and steplessly adjustable in shaking amplitude from 0 to 8 cm by its own control knob. Each bank of seven manometers has its own indicator showing amplitude setting. Shaking frequency is steplessly controlled up to 200 strokes per minute by an

indicating tachometer. Each manometer is attached to an anodized aluminum back which can be instantly removed or replaced.

All parts coming into contact with the circulated water are non-rusting or durably plated for corrosion resistance. Trim is chrome-plated. Panel at the front of unit contains the necessary heating and cooling controls, pilot lights, shaking-amplitude and shaking-speed controls, tachometer switches, etc.

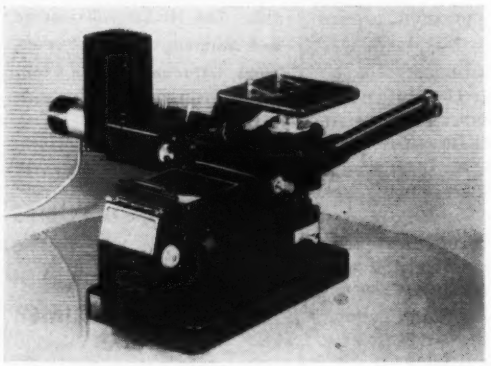
(Warburg units are manufactured by Bronwill Scientific, Inc., Dept. CP, 40 Worth St., New York 13, N. Y. . . . or for more information check CP 1896 on handy form, pages 2 and 3.)

Microscope-metallograph occupies 10 to 20 per cent of space required by normal units

Uses: In metallurgical laboratories for routine microscopy and metallography.

Features: Occupies only one-tenth to one-twentieth of the space normally taken by instruments used for this type of work. Group observation of specimen is also made possible by projecting the light beam through the camera housing onto a screen.

Description: Utilizing the Le Chatelier, or inverted, design the Galileo "CSF" Microscope-Metallograph confines all operations to an area 13 x 8 x 8". Inclined eyepiece tubes make obser-



Does routine metallurgical operations in 1/10th of space required by similar units

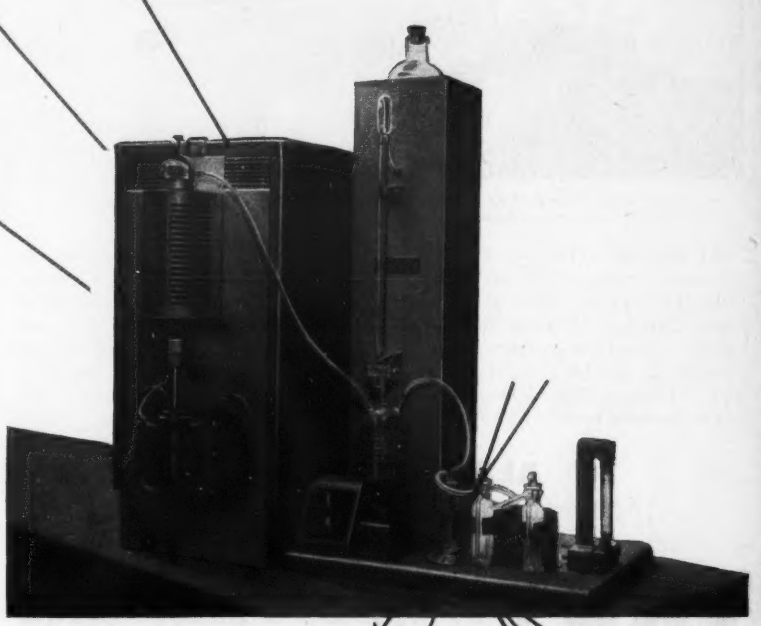
vation from a seated position easy and comfortable; a slight pull on mobile prism knob directs light path to camera screen at left of instrument assembly.

Unit allows sharp, brilliant visual observation at all magnifications up to 1000X and photographic and projection observation up to 1500X. A 2-½ x 3-½" reflex camera is supplied which takes both plates and roll film.

Unit is provided with two dry objectives for low and medium magnification and one oil immersion

(*Continued on next page*)

NOW YOU CAN DETERMINE CARBON AND SULFUR CONTENTS IN A SINGLE OPERATION:



. . running time cut from 35 to 10 minutes

The days of running two separate tests to determine carbon and sulfur contents of iron and steel are over. The Research Laboratories of Lindberg Engineering Company, with the cooperation of A. C. Holler, Twin City Testing & Engineering Laboratory and W. K. Aites of Westinghouse Airbrake Company have developed a new process utilizing a Lindberg high frequency combustion unit to test for *both* carbon and sulfur in a single operation . . and in a total of only 10 minutes!

This represents a time saving of 22 to 25 minutes over conventional methods that require a combined running time of 30 to 35 minutes . . (samples had to be heated in a resistance type furnace for 15 minutes to determine carbon content . . 20 minutes to determine sulfur content).

The Lindberg high frequency combustion unit used in this process is a rough and ready unit, designed and built by the makers of the famous Lindberg heat treating furnaces. It's engineered to heat samples at temperatures up to 3000°F . . substantially higher than previously practical with resistance element furnaces.

If you already have your high frequency equipment, you'll want to adopt this time saving process immediately. If not, check with your nearest Lindberg Laboratory Equipment dealer for details on the Lindberg "HF" unit and this new time saving process.

Here's how the new procedure works:

1. Put 1 gram metallic sample of unknown in ceramic cupelet. 2. Add approximately ¼ gram fine mesh tin to accelerate action . . and cover sample lightly with alundum to prevent splatter and minimize generation of iron oxide. 3. Place cupelet on induction unit pedestal, and raise to position in center of work coil, which surrounds a gas-tight "Vycor" glass tube. 4. Introduce controlled flow of oxygen which purges air from entire system and supports combustion. 5. Turn power from standby to plate position which starts inductive heating . . after 3 minutes, unit automatically switches from plate back to standby position. 6. Products of combusion flow to sulfur titration vessel where all SO_2 is absorbed. 7. Next, remaining products of combustion pass to sulphuric acid tower and magnesium perchlorate bulb for drying . . and then to standard type gravimetric determination bulb containing ascarite.

Now, to make the actual measurements:

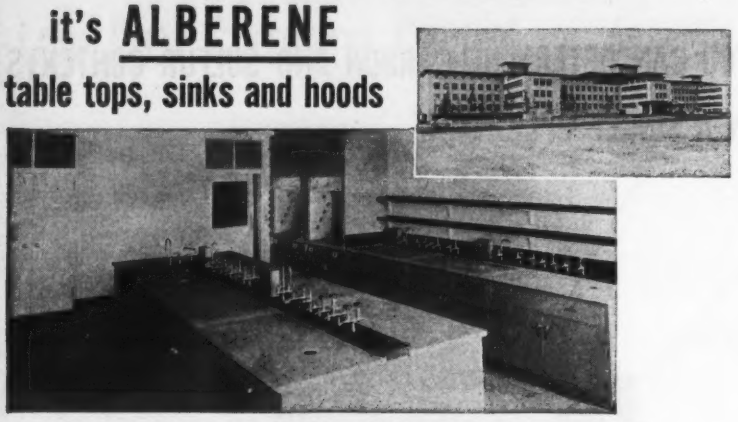
1. Flush entire system for 3 minutes . . (then remove gravimetric determination bulb).
2. Titrate to get specific color change to show end point.
3. Read solution level (direct reading) to determine percentage of sulfur in sample.
4. Next, weigh absorption bulb to determine change in weight due to addition of CO_2.

LINDBERG LABORATORY EQUIPMENT DIVISION

Lindberg Engineering Company • 2480 West Hubbard Street • Chicago 12, Illinois

When inquiring check CP 1897 on handy form, pgs. 2-3

In Well-Equipped, Modern Labs it's ALBERENE table tops, sinks and hoods



Esso Research Center of the Standard Oil Development Company at Linden, N. J. Over 12,000 square feet of Alberene Stone are used in the new lab's table tops and sinks.

You'll find many of the newest and finest laboratories in the country are equipped with table tops and sinks of Alberene Stone. Because Alberene Stone is a natural material that is highly corrosion-resistant . . . durable . . . and attractive. And . . . because Alberene Stone is easy to handle—easy to drill and cut.

Alberene offers you expert engineering assistance based on more than fifty years experience in equipping laboratories. For information and technical advice, just write Alberene Stone Corporation of Virginia, 419 Fourth Avenue, New York 16, N. Y. Or better yet—why not visit our nearest branch office?

ALBERENE STONE

When inquiring check CP 1898 on handy form, pgs. 2-3

TROY *Angular* MIXERS

Powerful

the *heavy duty* mixer that can easily handle pastes, semi-pastes, and very viscose liquids

Efficient

the mixer that provides a unique multi-directional mixing action; agitator arms sweep the side and the bottom tending to turn the material in while raising it; at the same time it folds the material in at the top from side to center.

Our Bulletin GR-51 gives full details of the TROY Angular Mixers. Send for your copy.

We are getting repeat orders from companies that have tried the 40 and 60 gallon TROY Angular Mixers competitively with conventional change tub mixers and found that the TROY Mixer produced better mixing in shorter mixing cycles. Because of the better mix, some of these companies saved not only time in mixing but money in subsequent operations.

If you are looking for a mixer that you hope can do just that in your plant—produce better mixing in shorter mixing cycles — you should investigate the TROY Angular Mixer.

Process Machinery Division — Established 1870

TROY ENGINE & MACHINE CO.

TROY, PENNSYLVANIA, U.S.A.

When inquiring check CP 1899 on handy form, pgs. 2-3

(*Continued from preceding page*)

objective for high magnifications. All are individually mounted and centered on interchangeable slide holders. They are supplied in standard ASTM magnifications of 50, 75, 100, 200, 500, 1000 and 1500X. Intermediate values are available.

Seven interchangeable photographic lenses are supplied to cover the full range of magnifications up to 1500X. Exact focusing of reflex camera is done on the horizontal ground glass screen, and a precision-built shutter provides time, bulb and a wide range of exposures from 1 second to 1/250th of a second.

Thirty watt concentrated filament low voltage bulb enclosed in finned housing and an aspherical condenser provide the light source. An opaque illuminator of the thin plane parallel plate type, provided with an annular mirror, permits the use of both normal bright field objectives and the special objectives for reflected-light dark-field observation.

Shock absorbent mounting damps external vibrations and makes use of the unit practical even in laboratories located in plants where heavy machinery is in operation.

(Microscope-metallograph is distributed by Opplem Co., Inc., Dept. CP, 352 Fourth Ave., New York 10, N. Y. . . . or for more information check CP 1900 on handy form, pages 2 and 3.)

Rugged osmometer minimizes possibility of breakage and frequency of repair . . .

designed for easy and rapid assembly; operation is simple and convenient

Experience has indicated that while glass instruments for measurement of osmotic pressure are relatively easy to make, they are fragile and may require frequent repair. Small metal osmometers offer the advantage of greater ruggedness and, moreover, they can be designed for easy and rapid assembly and simplicity of operation.

Two scientists at the National Bureau of Standards have developed a small, rugged osmometer, largely of metal construction, with a design which permits the unit to be assembled, rinsed, and filled conveniently while keeping the membrane wet with solvent at all times. Solution cell holds less than 2 ml so that a relatively small quantity of polymer suffices for a complete osmotic pressure curve.

A nickel-plated brass cell contains the polymer solution whose osmotic pressure is to be measured. A vertical glass capillary of 0.5 mm bore is inserted in the top of the cell, and a semipermeable membrane is stretched horizontally across an opening in the bottom of cell. The cell, membrane and lower portion of the capillary are immersed in the solvent or the polymer solution. Liquid level in capillary, showing the rise of polymer solution due to osmotic pressure, is compared with the level of pure solvent in a reference capillary attached to the measuring capillary by either a metal or a glass bridge.

When the osmometer has been filled with solution, it is placed in a constant temperature bath. A revolv-

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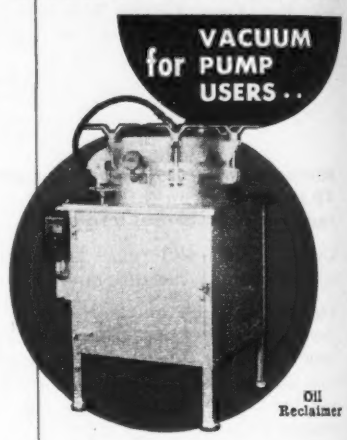
it's the

HILCO OIL RECLAIMER

VACUUM for PUMP USERS . .



Oil Reclaimer

A simple, economical and efficient method of restoring contaminated lubricating and sealing oil to the full value of NEW OIL. The HILCO will produce and maintain oil free of solids, gums, water and gases in a continuous, all-electric, automatic operation.

Be SURE of clean oil in your HIGH VACUUM PUMPS

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990 Bay St., Toronto, 3464 Park Ave., Montreal

When inquiring check CP 1901 on handy form, pgs. 2-3

ing carriage in which 12 osmometers can be mounted in the bath allows each osmometer to be brought into position for measurements of the meniscus heights with a cathetometer. Membranes of cellophane, regenerated cellulose and denitrated collodion have been used successfully in the instrument.

The unit sometimes requires 2 to 3 days for osmotic equilibrium to develop, although this depends primarily on the initial head and permeability of the membrane; and occasional membrane buckling makes it difficult to make dynamic measurements, as is the case with any osmometer that supports the membrane on only one side.

Unit has advantages of rugged and simple construction; rapid assembly, rinsing and filling of the cell; minimum possibility of the membrane's drying; and small cell volume (1.2 ml). Design of unit reduces possibility of entrapment of air in cell and makes it easy to soak the cell in a large volume of solvent to minimize adsorption of polymer.

(Technical information concerning the osmometer is available as a reprinted National Bureau of Standards Research Paper (No. 2377), obtainable from Superintendent of Documents, Government Printing Office, Washington 25, D.C.)

Demineralizing unit needs only water pressure for operation . . .

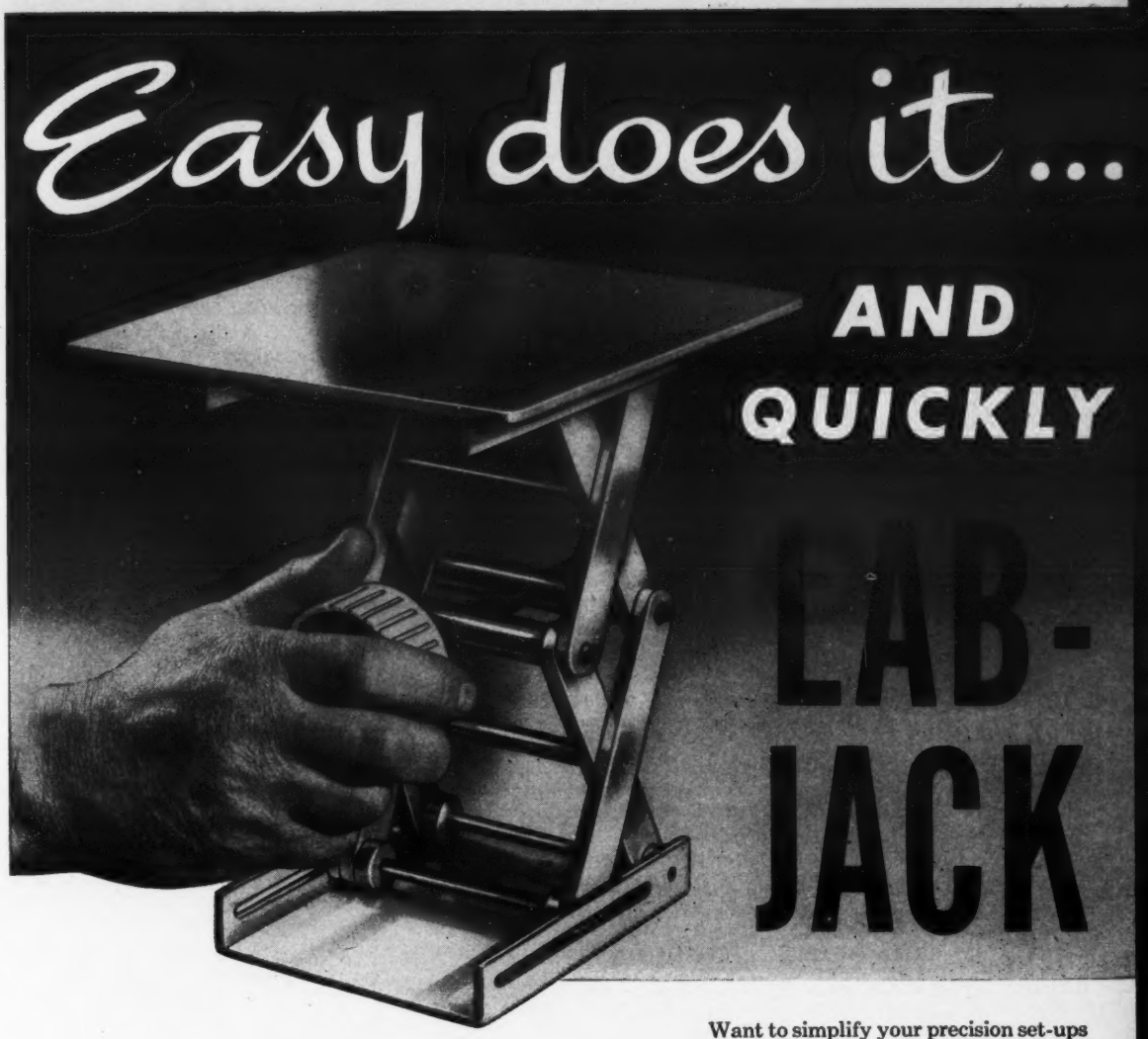
can supply up to 10 gph of high purity water, sight indicator simplifies adjustment

Uses: Useful for commercial users of reasonable quantities of high purity water, such as laboratories of all types, users of storage batteries, etc.

Features: Unit incorporates cartridge which does away with the need to purchase expensive new cartridge and screens when the resins need replacing. Meter which is built into unit plugs into any AC outlet to provide continuous conductivity information relative to the purity of the treated water. Sight indicator is provided for aid in adjusting intake flow to the optimum rate for most efficient ion exchange action.

Description: Employing a mono-column demineralizing method (a mixed bed of cation and anion resins in a single column), the 1953 Model Penfield Permanent Cartridge Demineralizer is capable of supplying up to 10 gph of high purity water. With raw water containing 5 gr of solids, one resin charge furnishes 200-230 gal of mineral-free water, according to manufacturer. Unit, which weighs only a few pounds, can be attached to any wall near a water tap or can be mounted on a laboratory stand, available as accessory equipment. All that is necessary to obtain purified water at will, is to connect the intake hose to the tap, insert the outlet hose in a receptacle, and turn on the faucet.

(Unit is manufactured by Penfield Manufacturing Co., Inc., Dept. CP, 19 High School Ave., Meriden, Conn. . . . or for more information check CP 1902 on handy form, pages 2 and 3.)



Want to simplify your precision set-ups . . . prevent breakage of glassware . . . save valuable research time?

The new Cenco-Lerner Lab-Jack is an all-purpose, general utility support that is quickly adjustable through an elevation range of about 7 inches. Its smooth, fast operation makes it particularly useful in isotope research where precision set-ups are required and it offers worthwhile advantages when used for supporting hot plates, oil baths, large Dewar flasks, ground-joint glassware, receivers, etc.

The Lab-Jack is made of stainless steel and aluminum with large plastics control knob. Top plate is 5½" x 4¾". Included also is a support rod and an 8" x 8" auxiliary top plate for use when a larger area is required.

Make a note now to include No. 19089 Lab-Jack on your next order.

Complete information about Lab-Jack including specifications and prices, will be found in our Circular No. 1213. Write for your copy today . . . no obligation.

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Refinery Supply Company RSC Tulsa • Houston

When inquiring check CP 1903 on handy form, pgs. 2-3

Turret facilitates use of redesigned unit for oil testing . . .

instrument detects impurities by colorimetric analysis

Uses: Detection of contaminants in refined oils by means of color control.

Features: In earlier instruments, each color disc or combination of discs had to be removed and replaced by hand. Redesigned instrument incorporates a revolving turret for interchanging the discs.

Description: With the convenient revolving turret and design modified to meet ASTM specifications, the Improved Fisher/Tag Saybolt Chromometer may be used in testing of oils according to ASTM method D-156. In addition, comparison tubes in the redesigned model have the newly-required inside diameter of 17 mm instead of the earlier standard of 15 mm.

Unit is furnished complete with revolving turret and Saybolt color discs (yellow uranium glass of various optical densities and colors), stand, tubes, eyepiece, diffusing mirror, integral etched-metal conversion table, wooden carrying case, and complete operating instructions.

(Unit is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 1905 on handy form, pages 2 and 3.)

All-glass unit gives fine, even spray

When operated from a low pressure, controlled air supply, micro unit provides a very fine, even spray which is useful for even distribution of reagents on paper in chromatography and other similar operations. Tube type can be used with as little as 1 ml of reagent; bulb type can be used with as much as 50 ml of solution.

(Manufactured by Michrochemical Specialties Company, Dept. CP, 1834 University Ave., Berkeley 3, Calif. . . . or reader may secure additional information by checking CP 1906 on convenient Reader Service slip between pages two and three.)

"MIGHTY MITE" SOLVES CHEMICAL PUMP PROBLEMS

The Eco All-Chem Pump is the All-Teflon and stainless steel pump that handles 70 percent of corrosive chemical requirements in Lab., pilot plant and small volume pumping in production service.

Simplify selection; standardize on fewer types, models, sizes; minimize maintenance problems.

READ THE SPECS . . . SPECIFY AND TRY

- *Type Pump:* Positive displacement with two opposed axially oscillating impellers equivalent to duplex piston operation.
- *Volume:* ½ to 10 g.p.m. maximum at 1750 RPM (water).
- *Pressures:* to 70 psi.
- *Suction Lift:* Highest over widest temperature and viscosity range.
- *Corrosion Resistance:* Lowest corrosion rate due to internal flow pattern. Handles all chemicals that stainless steel No. 316 will handle.
- *Pump Operating Characteristics:* Linear delivery. No air entrainment. Non-foaming. Unequalled for safety in handling hazardous liquids such as nitric acid and hydrogen peroxide. Self-priming on non-volatile liquids.
- *Drive:* Applicable to direct motor drive at 1750 RPM, as well as to all other standard driving methods.

All-Chem PUMPS ECO

ENGINEERING COMPANY

12 New York Avenue • Newark 1 • New Jersey

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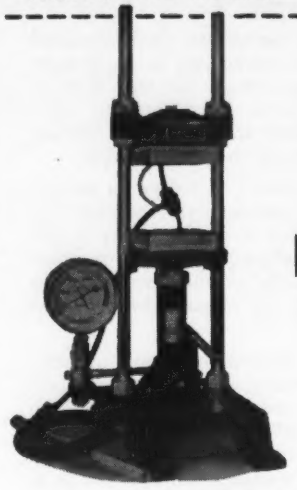
Standard for Research and Development



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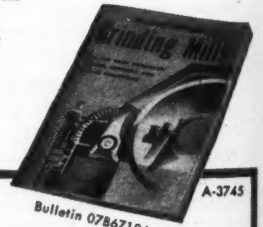
When inquiring check CP 1907 on handy form, pgs. 2-3

GET COMPLETE FACTS ON GRINDING MILLS

• Pebble Mills • Ball Mills • Rod Mills

Write for this *useful* 44-page book, Bulletin 07B6718A. Full of *helpful* facts on:

- Grinding media action.
- Mill applications.
- Wet vs dry grinding.
- Grinding circuits.
- Critical mill speeds.
- Grindability indices.



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Bulletin 07B6718A

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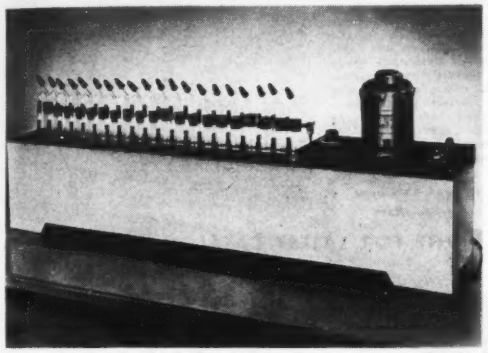
When inquiring check CP 1908 on handy form, pgs. 2-3

Determines keeping quality of fats and oils by oxygen method

Uses: Determination of relative keeping quality of lards, fats and oils.

Features: Provides higher operating temperatures with consequent reduction of test time and easier assembly of the air distribution system.

Description: The Sargent Fat Stability Apparatus accomplishes circulation of the electrically-heated mineral oil bath by means of an immersed centrifugal pump. Temperature may be adjusted



Reduces test time in determining relative keeping quality of fats and oils

over the range 95 to 115°C with regulation to plus or minus 0.1°C. Suspended cover rack accommodates 20 aeration tubes.

(Manufactured by E. H. Sargent & Co., Dept. CP, 4647 W. Foster Ave., Chicago 30, Ill. . . . or for more information check CP 1909 on handy form, pages 2 and 3.)

Automatic photometric instrument measures 5 characteristics

Gloss, haze, transmittance, reflectance and color can be quickly measured by convenient, automatic photometric unit in the testing of finished and proposed products in the paint, textile, paper, plastic and other fields. Photometric unit is utilized to translate the measurements made with various auxiliary instruments into direct readings. Placing a sample on the exposing instrument aperture drives the rotating fully automatic dials to the correct reading without manual manipulation by the operator.

Unit may be used in connection with problems of haze, gloss, transmittance, reflectance, color, opacity, turbidity, hiding power, washing efficiency, rate of darkening, goniophotometric properties and sheen. Specifications and features of unit are outlined in 4-page bulletin.

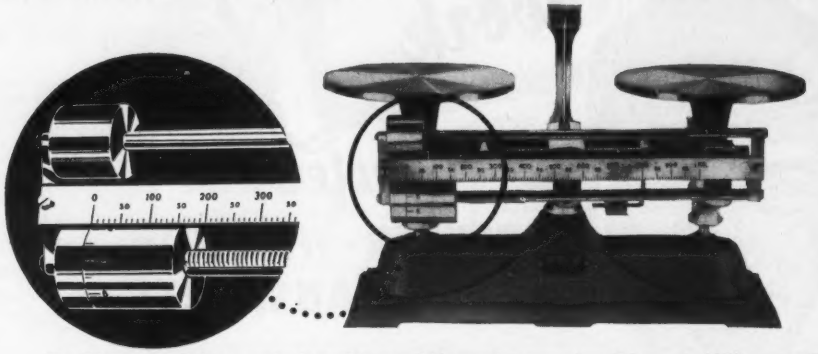
Bul 127 is issued by Henry A. Gardner Laboratory, Inc., Dept. CP, 4723 Elm St., Bethesda 14, Md. When inquiring specify CP 1910 on handy form, pages 2 and 3.

FOR LABORATORIES AND PLANTS

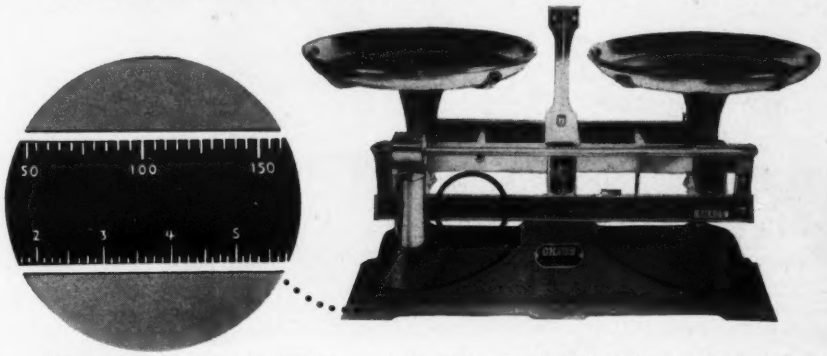
The New OHAUS Industrial Balances

Features

- Light weight — high strength Duralumin beam
- Capacity to 5 kg... sensitivity 0.5 gm
- Patented self-aligning agate bearings
- Precision hollow ground tool steel knife edges
- Dust proof bearing covers
- Clear reading etched graduated beams



The Micrometer Poise . . . makes it possible to weigh a complete range from 0.5 gram to 1000 grams without the use of loose weights. Poise is moved along the beam for rapid traverse, rotated for final positioning.



Single Beam with Dual Calibrations . . . both metric and avoirdupois standards make the balances extremely versatile. All models have a capacity of 5 kilograms and a sensitivity of 0.5 gram.

H-2845 Balance with Micrometer Poise. Capacity 5 kg, sensitivity 0.5 gram; beam calibrated 1000 x 0.5 gram. Furnished with 7" diameter satin finish stainless steel plates. Equipped with tare beam and poise of 1 pound capacity **$90.00**

H-2845-10 Balance with Micrometer Poise. Capacity 5 kg, sensitivity 0.5 gram; beam calibrated 1000 x 0.5 gram. Furnished with 9" diameter nickel plated brass pans. The removable pans are of equal weight and can be used interchangeably on either side of the balance. With tare beam and poise of 1 pound capacity. **$95.00**

H-2846A Balance — Single beam with dual calibrations. Furnished with 7" diameter stainless steel plates; beam calibrated 500 x 5 grams and 16 x ⅛ ounce. Complete with tare beam of 1 pound capacity. **$80.00**

H-2846B Balance — Single beam with dual calibrations. Furnished with 7" diameter stainless steel plates; beam calibrated 100 x 1 gram and 4 x ½ ounce. Complete with tare beam of 1 pound capacity . **$77.50**

H-2847A Balance — Single beam with dual calibrations. Furnished with 9" diameter nickel plated brass pans; beam calibrated 500 x 5 gram and 16 x ⅛ ounce. Complete with tare beam of 1 pound capacity . **$85.00**

H-2847B Balance — Single beam with dual calibrations. Furnished with 9" diameter nickel plated brass pans; beam calibrated 100 x 1 gram and 4 x ½ ounce. Complete with tare beam of 1 pound capacity . . **$82.50**

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When inquiring check CP 1911 on handy form, pgs. 2-3

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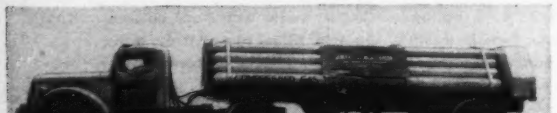
Photo courtesy of General Chemical Div. Allied Chemical & Dye Corp.

Why?—Because there's no rolling, lifting or sliding heavy cylinders when high pressure gases are delivered the Taylor-Wharton way.

In fact, there's no exchange problem at all. The first to appreciate this are customers, shipping and receiving personnel and drivers. Each T-W Gas Transport replaces 200-400 conventional high pressure cylinders, and can be delivered as a unit to remain right at the user's plant. When exhausted, the transport is returned to producing point for re-load.

Rugged design, careful workmanship plus our vast experience in producing seamless steel gas cylinders combine to make Taylor-Wharton Gas Transports the safest possible. Gross weight is 28,000 lbs., including 30 tubes mounted on single axle with 2-speed landing gear and air brakes. Write for details.



Units now in use carrying:

- Oxygen
- Nitrogen
- Helium
- Boron Trifluoride
- Hydrogen

TAYLOR-WHARTON GAS TRANSPORTS a product of

THE TAYLOR-WHARTON IRON & STEEL CO.

CINCINNATI 12, OHIO

ESTABLISHED IN 1742

Also Manufacturers of: Manganese Steel Castings, Alloy and Carbon Steel Castings, Special Trackwork, Gas Cylinders.

When inquiring check CP 1912 on handy form, pgs. 2-3

LABORATORY

Eliminates difficulties of rheostat burnout in extraction unit . . .

multiple place unit fabricated from stainless steel

Uses: For extractions, evaporations and distillations in all types of laboratories, including pharmaceutical, petroleum and rubber.

Features: Rheostats are rated and tested for continuous service at maximum wattage.

Description: The Labline 6-Unit Extraction Rack is fabricated of polished 18-8 stainless steel (case) and corrosion-resistant aluminum. Also included are 4 support rods of extruded aluminum — 2 horizontal and 2 vertical. Cast aluminum hot plates have long life nichrome heating elements which give faster, more uniform heat diffusion and heat transfer.

Case bottom and back are well ventilated to dissipate rheostat heat rapidly and keep case cool. Unit has range from 125 to 300 w (approximately 225 to 650°F.)

(Rack is a product of Labline, Inc., Dept. CP, 217-221 N. Desplaines St., Chicago 6, Ill. . . . or for more information check CP 1913 on handy form, pages 2 and 3.)

Discusses apparatus for gas analysis

Thirty-four-page, illustrated bulletin features a detailed discussion of various modifications in the Orsat gas analysis apparatus. In addition, separate section is devoted to several oscillometric accessories. Numerous charts and tables serve to amplify the text descriptions and data.

Subsequent sections deal with a micro projection reading balance, balance covers, stainless steel analytical weights, polyethylene bottles, automatic micro combustion apparatus, and other specialized units for various testing operations.

"Scientific Apparatus and Methods," No. 15 is issued by E. H. Sargent and Co., Dept. CP, 4647 W. Foster Ave., Chicago 30, Ill. When inquiring specify CP 1914 on handy form, pages 2 and 3.

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"Metalsmiths" Stainless Steel and Monel Utensils

METALSMITHS utensils are built to the exacting needs of corrosion-resistant service in the process industries. Efficiently designed—made of correct metal analysis and weight—fabricated by latest techniques—backed by over 30 years' specialization in corrosion-resistant equipment.

Prompt Shipment —Anywhere

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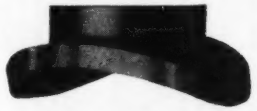
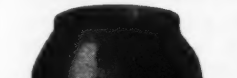
METALSMITHS

Division of Orange Roller Bearing Co., Inc.

556 White Street Orange, N.J.

When inquiring check CP 1915 on handy form, pgs. 2-3





Economy in pilot or development small lots as well as in program production can be achieved by consultation with Lenape for recommendations on seamless or weldment construction requiring:

- **Circular of symmetrical flanged or flued members of ¼" to 4" rolled plate stock.**
- **Upset flanged or plain forged and pierced rings.**
- **Truncated or closed cones.**

Expanded facilities have extended our range of capacity. Mail sketch or print direct, or consult nearest representative.

Take Advantage of

LENAPE CUSTOM FORMED PRODUCTS

LENAPE HYDRAULIC PRESSING AND FORGING CO.

LENAPE HYDRAULIC PRESSING & FORGING CO. DEPT. 10. WEST CHESTER, PA.

RED MAN PRODUCTS

When inquiring check CP 1916 on handy form, pgs. 2-3

Device accurately determines melting points of organics from 10 to 260°C . . .

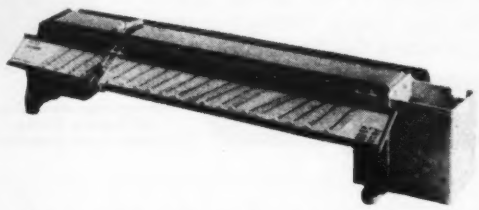
instrument has accuracy of plus or minus 1°C

Uses: Suitable for determination of melting points and eutectic temperatures and particularly useful for examination of waxes, oils, fats, and resins.

Features: Decomposition, behaviour of water of crystallization and volatility may be followed when they occur as accompanying phenomena with melting of a substance.

Description: The Kofler Hot Bench is available in two models — Standard and Lo-Temp Models. The Standard Model has a temperature range from 50 to 260°C, while the Lo-Temp unit has a temperature range from 10 to 210°C.

Construction of the two models is substantially the same except that the Lo-Temp unit has a cooling device consisting of a container attached to one end of the instrument for a mixture of ice and water.



Lo-Temp Hot Bench has cooling device attached and provides convenient method for determining melting points from 10 to 250°C

Each unit consists mainly of a metal body 1½" in width and 14½" in length, electrically heated to provide an almost linear temperature drop. A scale incorporating relative temperature readings is provided, and the scale is marked at 2 degree intervals for convenience. Since changes in ambient temperature will cause various points of temperature on the instrument surface to shift in position, it necessarily follows that the scale marks will be of a relative nature.

(Melting point units are distributed by William J. Hacker & Co., Inc., Dept. CP, 82 Beaver St., New York 5, N. Y. . . . or for more information check CP 1917 on handy form, pages 2 and 3.)

Gives comprehensive information on radiation detection units

Sixteen-page bulletin presents detailed information on boron trifluoride counters, flow counters, linear amplifiers, scalers, nucleometers and radiation safety devices. Publication includes numerous illustrations, and chassis views of electronic circuits are presented. Advantages, features and technical information are included.

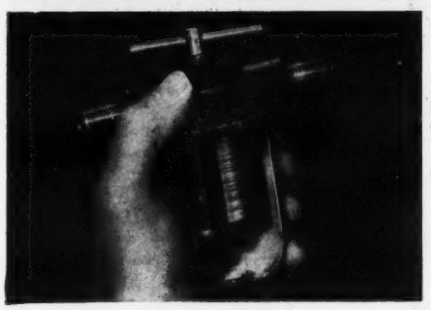
Catalog of radiation detection equipment is issued by Radiation Counter Laboratories, Inc., Dept. CP, 5122 W. Grove St., Skokie, Ill. When inquiring specify CP 1918 on handy form, pages 2 and 3.

Here's how this strainer "combs" itself clean!

This simple chalk test shows how AUTO-KLEAN's unique built-in comb construction cleans the strainer without costly interruption of flow

ORDINARY BLACKBOARD CHALK leaves heavy deposit of chalk particles on and between discs of Cuno AUTO-KLEAN strainer.

TURNING HANDLE ONE REVOLUTION moves strainer element through comb blades, removing all traces of chalk from between discs. Cuno's exclusive combing operation cleans *thoroughly* —without stopping flow.



FILTERING AREA IS COMPLETELY CLEAN, restoring full initial capacity. All chalk particles and dirt fall to bottom of housing where they can be drained periodically.

- AUTO-KLEAN's permanent metal filter element is available in steel, brass, or stainless steel for long, trouble-free service.
- AUTO-KLEAN is adaptable to any fluid-flow system.
- From acids to tar . . . if you can pump it, Cuno can filter it. Capacities range from one gallon per hour to 15,000 gallons per minute.

CUNO ENGINEERED FILTRATION

AUTO-KLEAN (disc-type) • MICRO-KLEAN (fibre cartridge) • FLO-KLEAN (wire-wound)

AUTO-KLEAN'S "NON-STOP" FLUID FILTRATION STEPS UP PRODUCTION IN CHEMICAL PLANTS

There's no need to shut down to clean this strainer!

The Cuno AUTO-KLEAN is the only fluid cleaner on the market that operates continuously—without requiring costly interruptions in flow and service. Cuno's exclusive "comb-clean" action allows *complete* cleaning of the filter element without stopping fluid flow.

Thus, no loss of production, no chance of contaminating the product by exposure while cleaning or replacing an element.

AUTO-KLEAN's low pressure drop permits *full-flow* operation on gravity, low pressure, or suction lines—with no loss in operating efficiency. AUTO-KLEAN's compact construction provides this full-flow fluid protection in space which would limit ordinary filters to by-pass service.

The low maintenance costs of the AUTO-KLEAN save you money, for there are no cartridges to change. An occasional rotation of the handle does a thorough cleaning job (most units can be equipped with motor-drives for continuous cleaning).

Fixed-space metal discs in this modern strainer positively remove all solids larger than the specified disc spacing—from .0035" up to .062".

Find out now about Cuno's AUTO-KLEAN—the precision-built strainer.

A.3.2

Cuno Engineering Corporation
Dept. 162A, 5o Vine Street, Meriden, Conn.

Please send information on Cuno AUTO-KLEAN for .....
(fluid)

Name.....

Company.....

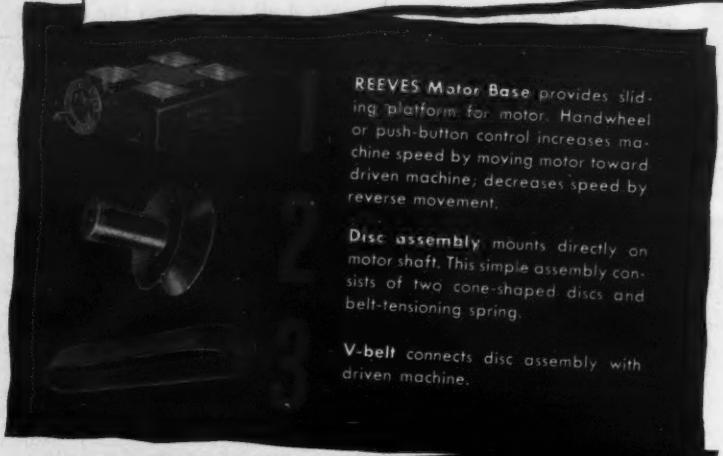
Address.....

City.....Zone....State.....

When inquiring check CP 1919 on handy form, pgs. 2-3

REEVES
Vari-Speed Motor Pulley

Converts any standard, constant-speed motor to a Variable-Speed Drive



REEVES Motor Base provides sliding platform for motor. Handwheel or push-button control increases machine speed by moving motor toward driven machine; decreases speed by reverse movement.

Disc assembly mounts directly on motor shaft. This simple assembly consists of two cone-shaped discs and belt-tensioning spring.

V-belt connects disc assembly with driven machine.

RESULT:

● **REEVES** Vari-Speed Motor Pulley is the easiest, lowest-cost method of giving a constant-speed machine stepless speed adjustability. Eliminates all complicated electrical hook-ups, chain drives, gears, etc. . . . widens machine work range, increases rate of production and reduces production cost by providing the right speed for each operation under every changing condition—*without stopping the machine.* Send for complete information to Dept. CP6b-G

REEVES PULLEY COMPANY • COLUMBUS, INDIANA

Recognized leader in the specialized field of variable speed control

STEPLESS! ACCURATE! POSITIVE!

REEVES Variable Speed Drives

When inquiring check CP 1920 on handy form, pgs. 2-3

LABORATORY

Simple device permits transfer of corrosive materials . . .

pump is fabricated of plastic

Uses: Transfer of liquids such as solvents, alkalis and acids.

Features: Unit uses parts which are fabricated of acid-resistant plastic, usable for temperatures up to 40°C.

Description: Particularly suitable for transfer of corrosive materials from carboys to smaller containers, the Frinet Acid Pump consists of 4 elements — a standpipe, rubber stopper, foot pump and a safety valve. The standpipe is adjusted to the depth of the container by moving it up or down inside the rubber stopper.

Air pressure to force out liquid is provided by the foot pump. Pulling handle of safety valve immediately stops flow, and avoids splashing as vacuum action will draw back instantly all liquid in the standpipe. There are no moving parts to jam or wear out. Tapered stopper fits wide range of container mouth openings.

(Pump is distributed by Paul C. Roche Co., Inc., Dept. CP, 11 Park Pl., New York 7, N. Y. . . . or for more information check CP 1921 on handy form, pages 2 and 3.)

Multi-purpose testing unit is compact, portable

Because of its compact size, multi-low-range tensile strength tester takes up little space in the laboratory and may be easily moved about wherever it is needed. It will test paper, thread, fabrics, plastics, springs, film, cord, leather, wire, resins, adhesives, glass, wood, ceramics, felt, cardboard, insulation, and virtually any material light enough to fall within range of its four scales.

Special attachments for use with tester, features of unit and its specifications are given in 4-page, illustrated bulletin.

Bul LR-2 is issued by W. C. Dillon & Co., Inc., Dept. CP, 14620 Keswick St., Van Nuys, Calif. When inquiring specify CP 1922 on handy form, pages 2 and 3.

Technicians Prefer *Despatch* LABORATORY OVENS

speedy accurate results

Model V-31, 37" x 25" x 50", 12 KW, Max. Temp. 500° F

An exacting testing and production oven that provides very close heat uniformity. Built-in indicating temperature controls. Emphasis has been on heavy construction . . . even heat distribution . . . capacity loads at high speed . . . ability to "stand the gaff"—even under continuous 24-hour-a-day usage. Six sizes and types are available for the endless variety of heating, drying, baking and testing processes. Get Bulletin No. 107.

ovens for all purposes

DESPATCH Established OVEN CO in 1902

343 Despatch Building
MINNEAPOLIS 14 MINNESOTA

When inquiring check CP 1923 on handy form, pgs. 2-3

Quality Fabrics —FOR THE

Chemical **INDUSTRY**

"The Preferred Source of Supply"

"SAN JUAN"® Cotton Duck
NUMBERED DUCK
IN ALL WIDTHS AND WEIGHTS

Filter Twills • Chain Cloths
Press Cloths • Enameling Duck
Selected Osnaburgs

Our technicians will gladly aid in creating industrial fabrics to your specification. We solicit your inquiries.

B. J. BARRY & CO.
INCORPORATED
62 WORTH STREET • NEW YORK 13
AKRON • BOSTON • LOS ANGELES • NEW ORLEANS
MILLS AT: Lincolnton, N. C. and Roanoke, Ala.

When inquiring check CP 1924 on handy form, pgs. 2-3

Facilities for crystal growing offered by packaged installation . . .

can be used with melt of luminescent materials with melting point between 100 and 500°C

Uses: For controlled growth of organic scintillation crystals. Facilities for the continuous cooling of the crystalline mass, after crystallization is completed, are available as optional equipment.

Features: All operations and adjustments are carried out from an easily accessible control panel. To avoid confusion all switching operations are separately indicated with color-coded pilot lights.

Description: Complete packaged installation includes Wakefield Crystal Growing Furnaces which are housed in a thermostatically controlled ambient temperature reservoir. Crystals are grown by the Stockberger method.

Molten phosphor material is transported through a sharp temperature gradient at the rate of one inch in thirty hours. Seed crystal formation and crystal-liquid interface propagation may be directly observed through conveniently arranged windows with internal illumination provided.

(Product of Wakefield Industries, Inc., Dept. CP, 5108 W. Grove St., Skokie, Ill. . . . or for more information check CP 1925 on handy form, pages 2 and 3.)

Discusses chemical topics from beer to instruments

Featuring a comprehensive discussion of the chemical, biochemical and engineering research behind the beer industry, informative publication describes and pictures several useful items of laboratory equipment. Products discussed range from an instrument which makes rapid determinations of tetraethyl lead in gasoline to a collection of special papers for determination of pH by means of color change over a wide range of hydrogen-ion concentration.

Designed to facilitate the formerly tedious analysis of tetraethyl lead in gasoline, a simple, pushbutton unit which measures, calculates and indicates the answer in ml/gal is described in a separate section. The unit utilizes polarography to speed the procedure.

Other items included in booklet are: a stainless steel spatula for semi-micro use; an improved power source for use with an ultraviolet spectrophotometer; two types of chromatographic paper; a machine for making flaked ice for laboratory use; several reagent chemicals; a shockproof bench top for use in laboratory fume hoods; and several solvents for use in infrared studies.

"The Laboratory," Vol 22, No. 4, is issued by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. When inquiring specify CP 1926 on handy Reader Service slip between pages two and three.

CLARAGE *Multitherm* AIR CONDITIONING UNITS

THEY HEAT AND HUMIDIFY

THEY COOL AND DEHUMIDIFY

. . . . year-'round comfort at low cost

Clarage Multitherm Conditioning Units are double duty machines. They keep your place cool and dehumidified in summer. They heat and humidify in the wintertime.

You save considerable in cost by having the same equipment working for you the year-'round . . . and every day you're assured of comfortable working conditions.

Multitherm Units come in vertical and horizontal types as shown—ten sizes—capacities 600 to 20,500 c.f.m. You use a direct expansion refrigerant, cold water or brine for cooling; steam or hot water for heating.

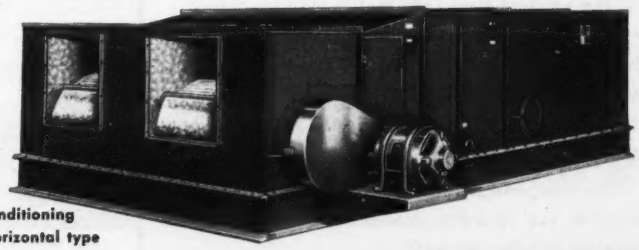
Multitherm Conditioning Unit—vertical type

. . . . or process conditioning

Aside from comfort applications in offices, plants, stores, etc., Multitherm Units are widely used in industry where production depends upon a certain temperature and humidity. Clarage Capillary Conditioners are available for cases where extremely close control is needed to meet requirements.

We welcome your inquiry for any desired information.

CLARAGE FAN COMPANY
Kalamazoo, Mich.



Capillary Conditioning Unit—horizontal type

You can Rely on . . .

CLARAGE

Headquarters for Air Handling and Conditioning Equipment

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

When inquiring check CP 1927 on handy form, pgs. 2-3

Instruments and Controls operate at approximately room temperature . . . there is no trapped heat.

As a result of correct insulation design, you can shift rapidly to desired operating temperatures.

Reversible and easily replaceable Multiple Units, time-tested for 30 years, have been retained.

36 steps of control through a Hevi Duty Tap-Changing Transformer allows maximum flexibility of control.

Controls are mounted in a recessed position for safety and at correct angle for proper vision.

Rear panel is removable for access to terminal board. Release of front panel permits control assembly to slide forward.

HEVI DUTY

"MULTIPLE UNIT"

MUFFLE FURNACE

For Temperatures To 2000° F.

This furnace has been designed for general laboratory requirements such as drying of precipitates, ash determinations, fusions, ignitions, heating metals and alloys, enameling, heat treating, and experimental test work.

The efficient Hevi Duty Muffle Furnace shown is housed in a cylindrical shell mounted on a pyramidal type base with practicaly line contact between them . . . allowing for free circulation of air and eliminating trapped heat in the base. Available in four standard sizes.

For complete details, construction, and specifications, see your Laboratory Supply Dealer, or write for Bulletin LAB-849.

"MULTIPLE UNIT"

HEVI DUTY ELECTRIC COMPANY

MILWAUKEE 1, WISCONSIN

Heat Treating Furnaces... Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

When inquiring check CP 1928 on handy form, pgs. 2-3

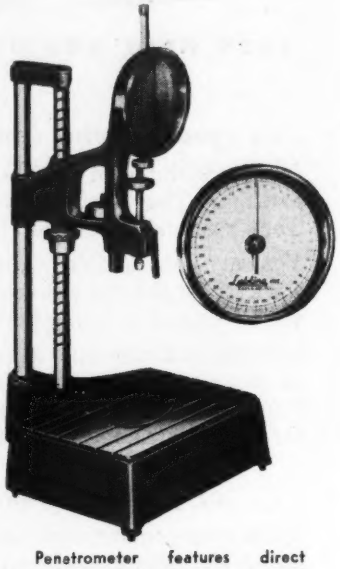
LABORATORY

Will accommodate cones, needles of all types

Uses: In the petroleum, food, baking and dairy fields for such tests as ASTM D-5, D-217 and similar tests.

Features: All types of needles and cones, including new micro-cone, may be used with unit.

Description: Designed to simplify its use and help eliminate mechanical and reading errors, the Labline Penetrometer employs a chuck-type collet on plunger which provides secure gripping and vertical alignment. Penetration shaft is rigidly kept in alignment by two bearings, independent of depth rod, is accurately weighed, has provisions for holding extra weights and can be removed for weighing or changing plungers without disassembling head.



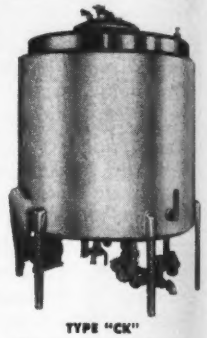
Penetrometer features direct reading dial with easy-to-read scale divisions

Unit has full 5" dial with convex glass lens giving easiest reading of graduations. Dial reads directly to 40 mm in 400 1/10th mm divisions. Manufacturer claims that unit has deepest penetrating range in single dial sweep penetrometers.

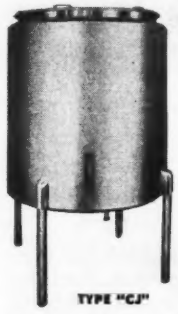
(Unit is a product of Labline, Inc., Dept. CP, 217 N. Desplaines St., Chicago 6, Ill. . . . or for more information check CP 1929 on handy form, pages 2 and 3.)

What's eating your stainless steel tanks?

For more than a quarter century Metal Glass Products Company of Belding, Michigan has specialized in the manufacture of stainless steel tanks for all phases of the processing industries. In that time they have come to know the advantages and limitations of stainless steel fabrications for industry. The design engineers at Metal Glass realize that stainless steel is not the cure-all to corrosion and wear that many believe it to be. They know that there are many acids, salts and organic substances that will attack stainless steel tanks. They realize that special care must be taken in every step of installation and fabrication to keep their tanks unaffected when used with various liquids. The performance of the units in actual plant operation depends to a large extent upon the manner in which the installation was made and the daily treatment accorded the equipment.



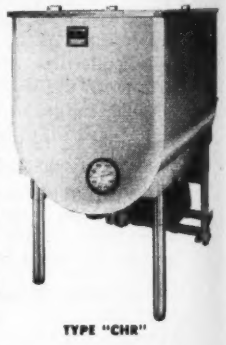
TYPE "CK"



TYPE "CJ"

For these reasons Metal Glass attempts to make every unit a custom built model. Even the standard items illustrated in this article are precision built. Despite the care exercised in building standard units, there are many applications that call for a specially designed piece of equipment. It is in cases like these that it pays to call on Metal Glass. Our engineers working with your personnel can develop a tank to meet your exact requirements. Our engineering department is set up and maintained to help you on your special tank problems. We welcome the opportunity to work with you.

In addition to experience in the specific characteristics of metals with reference to corrosion resistance, heat transfer and general machinability, we can offer you considerable knowledge in insulating materials, types of refrigerants and metalizing processes.



TYPE "CHR"

Write us today for assistance or consultation on your problem.

STAINLESS STEEL SAN-I-TANKS

METAL GLASS PRODUCTS COMPANY

BELDING 11, MICHIGAN

DISTRICT OFFICES: New York • Chicago • Atlanta • Detroit Pittsburg • Pasadena • Toronto

When inquiring check CP 1930 on handy form, pgs. 2-3

Heavy-duty scales permit accurate, rapid weighing

Uses: Useful for weighing bulk materials as well as in packing, mixing, and ingredient mixing operations.

Features: Incorporate over- and under-weight mechanism which not only speeds weighing operations, but makes them more accurate.

Description: Detecto-Gram Packing Scales are available in two models — Model 8800 for bench use and Model 8900 for floor use. Units incorporate adjustable dashpot, with special oil, to give positive pointer control; gives quick-stop action without pointer "float." Short platter fall multiplies operating speed. Bronze check rods and ball bearing check links minimize friction and stand up under hard usage.

Packing scales incorporate mechanism to speed industrial weighing operations. Adjustable tower and design of dashpot offer convenience and accuracy in heavy-duty unit

Slightest deviation in required weight over or under, is immediately indicated by pointer moving off zero. Any discrepancy in weight is made easily visible, even from a distance, by having movement of pointer magnify movement of beam a number of times. Convenience is added by having tower adjustable to face in four different directions.

(Scales are products of Detecto Scales, Inc., Dept. CP, Park Ave. and Sanford St., Brooklyn 5, N. Y. . . . or for more information check CP 1931 on handy form, pages 2 and 3.)

Company name and address . . .

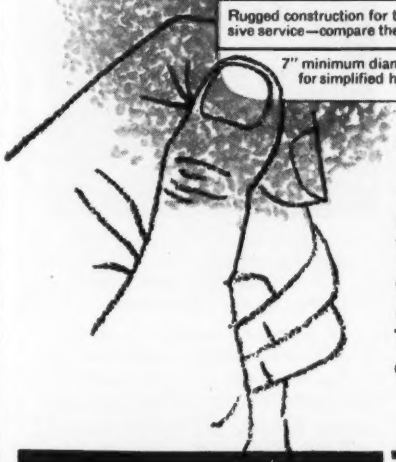
at end of each editorial article makes it easy to follow-up on ideas you read about in these columns . . . saves you time. Write direct or use the handy Reader Service slip.

THE EDITORS

STAINLESS STEEL
VALVE COMPARISON CHART

BASED ON 2" GATE	COOPER ALLOY	COMPETITORS A	B	C
Ball and socket rotating type disc for positive seating with minimum galling	✓	✓		
Discs and seats designed for simple reconditioning in the field	✓	✓		
Centerless ground stock to cut packing wear	✓	✓		
¾" minimum stem diameter to assure rigidity	✓		✓	✓
Deep stuffing box with six turns of ¼" square packing	✓		✓	
Packing gland designed to deliver square, uniform compression	✓			
Two piece gland construction to prevent gouging of the stem	✓	✓		✓
Swinging eyebolts to simplify repacking and provide added safety	✓			
Simplified yoke nut construction to permit replacement without interrupting service	✓			✓
Grease fitting to eliminate friction on yoke nut during opening and closing	✓			
100% x-ray of vital cast components	✓			
A stainless steel valve designed and produced by stainless steel specialists	✓	✓		
Stocked in major industrial areas by nationwide distributor organization	✓		✓	✓
Rugged construction for tough corrosive service—compare these weights!	33 lbs.	28 lbs.	28 lbs.	24 lbs.
7" minimum diameter wheel for simplified hand closing	✓			

COOPER ALLOY VALVES PROVE SUPERIOR!



THE superior design of Cooper Alloy stainless steel valves means greater reliability and reduced maintenance costs. Make the comparison yourself and you'll soon agree that no other stainless steel valve gives you so many quality features . . . at no additional cost.

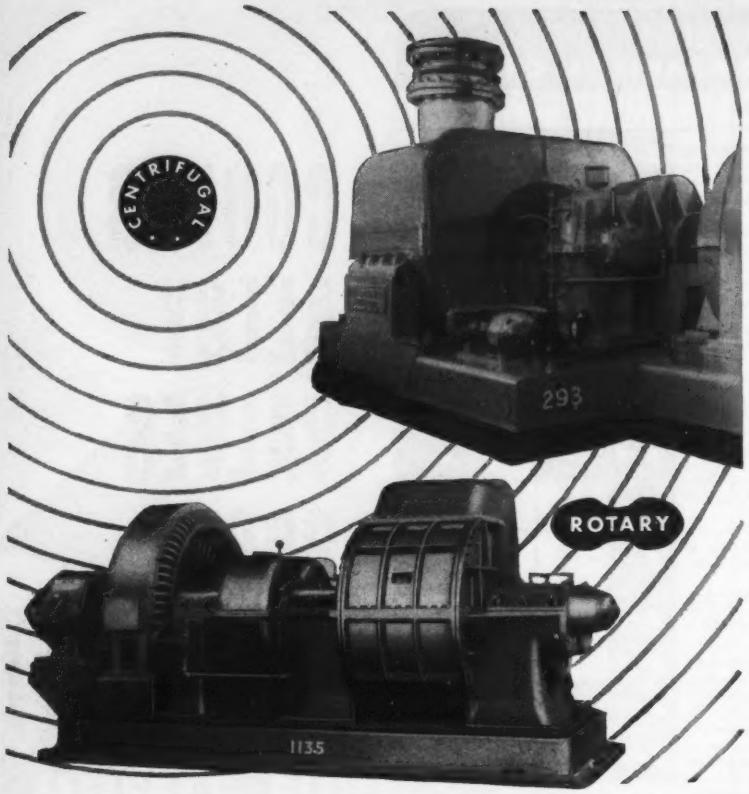
Our thirty years of experience in the casting of high alloys is your guarantee of the best in stainless steel valves, fittings and accessories. To get the full details, write today for your free copy of our 2" valve comparison chart.

THE
COOPER ALLOY
FOUNDRY CO. HILLSIDE, NEW JERSEY

Please send along my free copy of your detailed chart comparing competitive 2" stainless steel gate valves.

Name _____
Position _____
Company _____
Address _____
City _____ Zone _____ State _____

When inquiring check CP 1932 on handy form, pgs. 2-3



ONLY THE BLOWER *Specialists* BUILD THE DUAL-ABILITY LINE

To meet the varying problems of handling air or gas, in industrial processes, Roots-Connersville builds two complete lines of blowers and exhausters—Rotary Positive and Centrifugal. Together, they cover capacity requirements from 5 cfm to 100,000 cfm in single units. Centrifugals are available in multi-stage units, as illustrated, or in single-stage types.

Thus, this exclusive *dual-ability line* permits selection (without prejudice as to types) to meet the needs of most moderate pressure applications. Regardless of their sizes or types, R-C Blowers are unmatched in reliability, operating economy and long-time performance. Built into them is almost a century of specialized experience in handling gas and air, which is our exclusive business.

In addition to blowers and exhausters, R-C products include a wide range of gas and vacuum pumps, meters, inert gas generators and other related equipment. So, whenever you have a need for moving or measuring gas or air, we suggest consultation with the R-C Specialists.

ROOTS-CONNERSVILLE
Exclusive Specialists in Handling Gas and Air

ROOTS-CONNERSVILLE BLOWER A DIVISION OF DRESSER INDUSTRIES, INC. 536 Richland Ave. • Connersville, Indiana

When inquiring check CP 1933 on handy form, pgs. 2-3

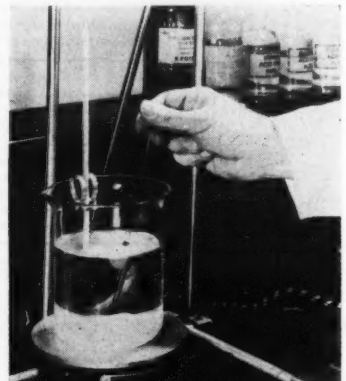
LABORATORY

Stainless steel clamp eliminates breakage of thermometers

Uses: For attaching thermometers to the lip of any beaker. Also useful for holding glass stirring rods and metal electrodes in position.

Features: Thermometers are always held upright and remain in position for reading.

Description: Made of tough, corrosion-resistant stainless steel, the Fisher Thermo-Clamp is an inch in diameter, three-quarters inch wide. Tension in the clamp holds any thermometer upright against the side of beaker even when the solution "bumps."



Handy, corrosion-resistant clamp positions and holds any thermometer in convenient reading position on side of any beaker

Clamp attaches thermometer to lip of beaker; mercury bulb of thermometer can then be adjusted to any height. Thermometer can still be used to stir the solution by momentarily disconnecting the clamp.

(Product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information check CP 1934 on handy form, pages 2 and 3.)

For viscosity data on glycerine-water systems see nomograph, page 206.

Inco-Cast Fittings to fit your need!

Monel® - Nickel - Inconel®

Whatever you need—you'll probably find the answer is an Inco-Cast fitting.

Here's why —

- **Resist most corrosives**
- **Withstand high and sub-zero temperatures**
- **Strong . . . tough . . . sound**
- **Protect product purity**
- **Pressure-tested**
- **Economical in cost**
- **All standard types and sizes in threaded and welding fittings**
- **Fast service on rated orders to all points from conveniently located distributor stocks**
- **Special shapes and sizes made to order**

WRITE TODAY
for your handy price list catalog. It gives you full information. Sent promptly on request—no cost or obligation to you.

INCO

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

When inquiring check CP 1935 on handy form, pgs. 2-3

1000 GALLONS DEIONIZED WATER 18¢*

(equivalent to distilled water)

*Based on 10 grain water

Elgin Ultra-Deionizer

Mineral impurities in water used for processing can cost a lot of money in rejects and inferior product quality. Objectionable spots on product surfaces following rinsing and drying is one example. Unwanted minerals left in chemicals and pharmaceuticals is another. Troubles encountered in countless processes can be traced directly to the mineral impurities in water.

The Elgin Ultra-Deionizer will eliminate such water troubles at a cost any plant can afford. It will produce large quantities of mineral-free water, of even higher quality than that obtained by distillation or evaporation — and at a mere fraction of the cost. Being a compact, simple-to-operate unit containing a mixture of cation and anion exchanging resins in a single tank it is low in investment and operating costs. That's why plants using two and four column demineralizers are replacing such equipment with the dependable new Elgin Ultra Deionizer.

Let us have our nearest representative show you how it can eliminate rejects and improve product quality in your plant — or ask for Bulletin 512.

Write today for complete data

ELGIN SOFTENER CORPORATION
180 N. Grove Avenue, Elgin, Illinois
WATER CONDITIONING FOR EVERY NEED

When inquiring check CP 1936 on handy form, pgs. 2-3

Working temps maintained with little variation by incubators . . .

have range from room temperature to 60°C

Fabricated from corrosion-resistant, heavy gage stainless steel, two heavy-duty laboratory incubators are of the gravity convection wet-type. Both units have an automatically controlled temperature range from room temperature to 60°C. Manufacturer claims that readings will not show more than ½°C variation after working temperature is reached.

Heating elements are of Nichrome — operating at low wattage and giving off black-heat which is rapidly dissipated, eliminating heat lag and temperature creep. Units are designed to operate on either 110 v AC-DC or 220 v AC-DC.

(Products of The Fischman Co., Dept. CP, 10th at Allegheny Ave., Philadelphia 33, Pa. . . . or for more information check CP 1937 on handy form, pages 2 and 3.)

Tubeless unit simplifies radioactivity counting

Uses: As an accessory with any scaler to provide a direct reading of average count rate. Useful in routine sample counting.

Features: Employing no vacuum tubes, unit gives average count rate reading directly — no multiplication, interpolation, addition or division is necessary.

Description: The Raychronix Model C-11 Count Rate Computer has 5 automatic preset count ranges; a "Count-Stop-Clear" lever controls both the scaler and computer. At conclusion of counting, a pointer on 8" dial gives average count rate reading directly. Unit is housed in a portable, sloping, welded steel cabinet.

(Product of Radioactive Products, Inc., Dept. CP, 443 W. Congress St., Detroit 26, Mich. . . . or for more information check CP 1938 on handy form, pages 2 and 3.)

Glycerine determinations require 1/3 the time with titrator

Manual electrometric titrations for glycerine determinations are time-consuming and require setting up apparatus for each set of determinations. According to informative case history of an automatic titrator installation, one soap manufacturer reduced time for routine glycerine titrations from 3 to 1 hr. Self-operating potentiometric device has proved suitable for both the dichromate and periodate methods recommended by the AOCS for determining lye glycerine, crude glycerine and glycerine in soap.

Data File K-16-11 is issued by Beckman Instruments, Inc., Dept. CP, 820 S. Mission St., South Pasadena 1, Calif. When inquiring specify CP 1939 on handy form, pages 2 and 3.

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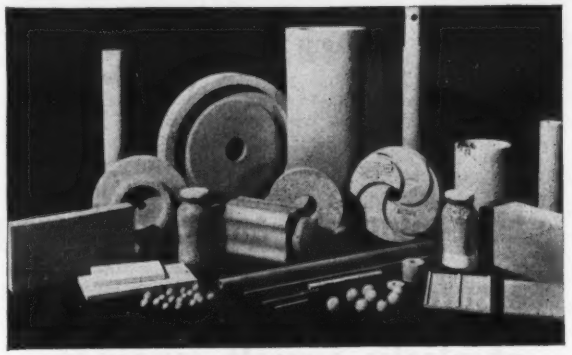
"Partners in Progress"

for laboratory, pilot plants, and production



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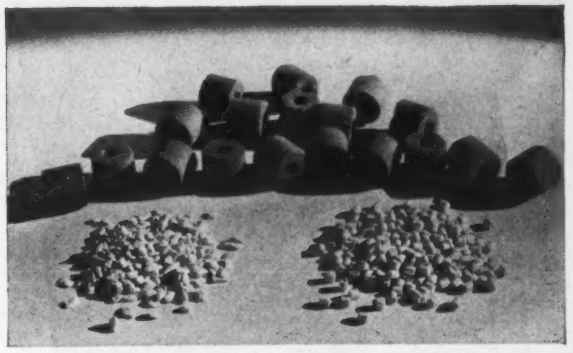

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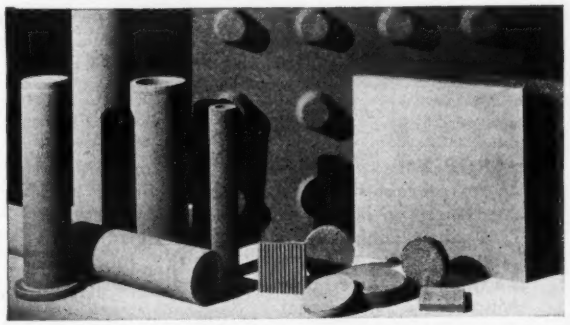

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processing equipment

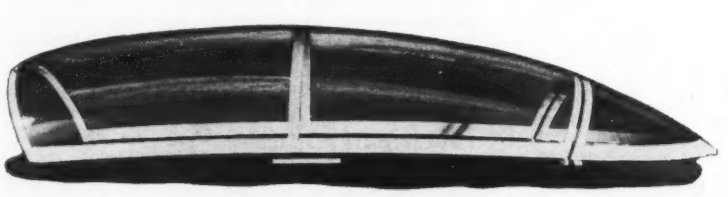
Low-humidity air conditioning assures transparency of plastic aircraft canopies

Perfect pilot visibility is permitted in this B-47 by the highly transparent shatterproof canopy

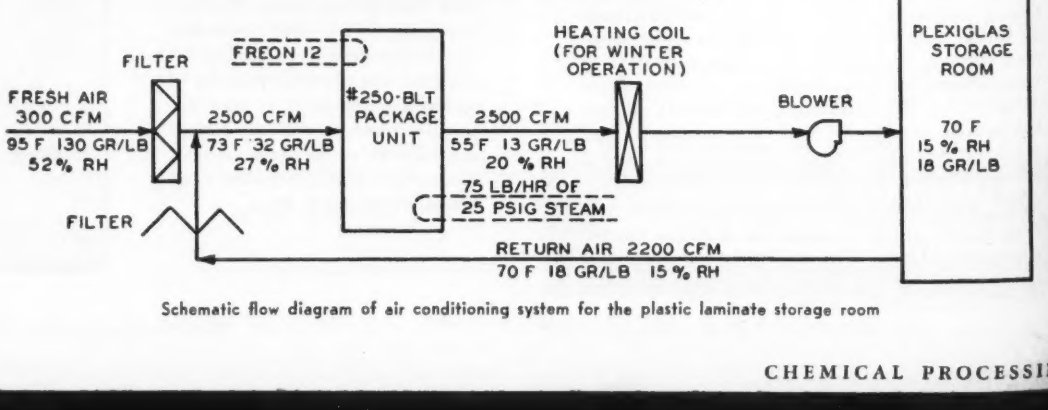
Storage of laminated sheets in room maintained at only 15% relative humidity prevents moisture damage and permits continuous production

PROBLEM: Goodyear Aircraft Company had to prevent moisture damage of plastic laminated sheets to be fabricated into aircraft canopies. Transparent laminate, known as Plexiglas, has 3 layers, the outer 2 being acrylic plastic. Inner layer is a highly plasticized polyvinyl butyral, an extremely moisture-sensitive material.

It is this soft inner layer, subject to moisture damage, which prevents the shattering of the entire structure when it is penetrated by a bullet. Cracks around a bullet hole, which spread in monolithic acrylic sheets, do not spread in this laminated material. Excess moisture absorbed by the butyral inner layer cannot be detected until the flat laminate is



Laminated plastic used in canopy is protected from moisture damage by low-humidity air conditioning



Schematic flow diagram of air conditioning system for the plastic laminate storage room

placed in heating ovens to obtain a supple material for forming. Moisture can cause bubbles to form in the inner layer, with resultant opacity, necessitating scrapping of the canopies.

In the past, it was required that the laminates be placed in the heating ovens immediately upon receipt at the plant. Production schedules for the hygroscopic material had to be dovetailed to coincide with incoming shipments. Since laminated sheets could not be stored for any length of time, incoming shipments were small and frequent. It seemed desirable to maintain a sufficient supply of plastic in storage to permit continuous operations.

Maintenance of a low-humidity condition 24 hours a day, however, presented some difficulties. To reach a level of 18 grains/lb using conventional refrigeration equipment would require cooling the air well below freezing in order to condense out the moisture. Then a large amount of air reheating would be necessary to bring the temperature back up to required room conditions of about 65 to 70°F.

In addition, in order to provide continuous operation, it would be necessary to have a duplicate set of cooling coils, so that one set could be defrosted while the second set performed its primary function. This appeared uneconomical, both from an initial investment and operating point of view.

Solution: Early in 1951, Goodyear installed a 2500 cfm air capacity Kathabar dehumidifier. This liquid-chemical-type, moisture-absorbing unit accomplishes the desired results while avoiding the usual below-freezing handicaps, such as shutdowns for defrosting.

A mixture of fresh air and air circulated from the storage room enters the lithium-chloride-base-solution dehumidifier at conditions of 73°F and 27% RH. Flow through the air conditioning system is shown in accompanying schematic diagram.

This air-mixture passes through a spray of the absorbing solution so as to reduce its moisture to a predetermined value. At the same time, both air and absorbent pass over Freon-12 expansion cooling coils. This has a two-fold effect. First, these coils control the temperature of the absorbent. Second, the air is cooled by the coils to obtain the desired delivery temperature of 55°F.

Control of the cooling coil temperature regulates both the leaving air humidity and temperature without the need for overcooling and reheating. Delivered air conditions of 55°F and 13 grains/lb (20% RH) are adequate to maintain the storage space at 70°F and 18 grains/lb (15% RH) when the temperature and humidity pick-up in the room are considered.

A small amount of fresh air — 300 cfm at maximum conditions of 95°F and 52% RH (130 grains/lb) — is introduced into system to pressurize the space. However, since it is more economical from an operating viewpoint, the bulk of the air — 2200 cfm — is recirculated from the room.

System is entirely automatic, as the absorbent is continuously reconditioned for subsequent use. After completing the dehumidifying pass, a small amount

(*Continued on next page*)

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The SK Engineering News is also published quarterly in magazine form. It describes new SK equipment and design modifications, features application information specifically selected to point out product features and advantages and to provide ideas for other uses. To get your name on the mailing list, check ☐

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When inquiring check CP 1942 on handy form, pgs. 2-3

(*Continued from preceding page*)

of the solution is sprayed over low-pressure steam coils in a separate chamber of the unit. Here, excess moisture in the solution is driven off and exhausted to the atmosphere by a scavenging air stream. A maximum quantity of 75 lb/hr of 25 psig steam is used for this purpose. Total moisture removed from the air amounts to 88 gallons of water per day under maximum operating conditions.

When a shipment of flat laminated plastic sheets is received, it is placed in the air conditioned storage room until required for processing. Temperature in the room may vary from the 65 to 70°F temperature since it is not as critical as the need to maintain the low absolute humidity of approximately 18 grains/lb.

Results: Air conditioning system has operated satisfactorily since it was placed in operation more than two years ago. Storage of the plastic laminates under the low-humidity conditions has protected the transparency of the aircraft canopies and permitted uninterrupted production.

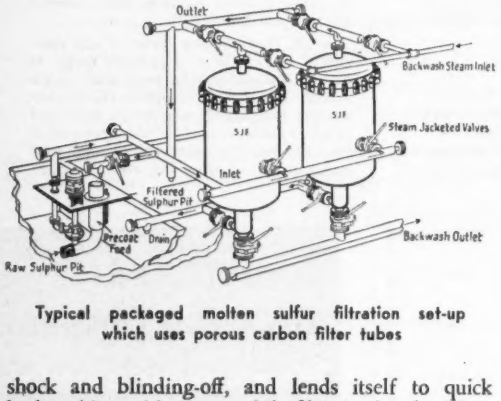
(Kathabar dehumidifier is built by Surface Combustion Corp., Dept. CP, Toledo 1, Ohio . . . or for more information check CP 1943 on handy form, pages 2 and 3.)

Quick backwash with steam puts molten sulfur filters back into action . . .

packaged plant has porous carbon filters, steam-jacketed pipe and valves, precoat device

Uses: Filtration of molten sulfur to remove impurities, including insoluble hydrocarbons.

Features: Supplied as packaged, complete filtering plant, with structural framework, ready to be placed on foundation pads. Filtering medium (porous carbon) is inert to corrosive action, resists thermal



Typical packaged molten sulfur filtration set-up which uses porous carbon filter tubes

shock and blinding-off, and lends itself to quick backwashing with steam, while filter is closed. Manual cleaning is not necessary because of the effectiveness of steam-backwashing; and the backwashing only takes about two minutes. Use of neutralizing lime is eliminated or substantially reduced.

System used for adding filter aid as precoat and body coat is simple, and does not include such equip-

Cut cost and corrosion ...with ALCOA ALUMINUM

Having trouble with shipping these products?

It's time to consider tank cars of aluminum.

Acetaldehyde
Acetic Acid
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Ethylene Glycol Monoethyl Ether Acetate
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Urea Ammonia Liquor

. . . and aluminum tank cars *cost a third less* than stainless steel tank cars.

If you are shipping liquid ladings such as these, tank cars made of ALCOA Aluminum offer you very real cost-cutting advantages. Aluminum does not contaminate or discolor sensitive liquids—does not promote decomposition. Result: *no damage to ladings, better end products.* Aluminum is highly resistant to most corrosive ladings—requires far less maintenance than other metals.

Write today concerning the compatibility of your commodity in aluminum tank cars. Remember, Alcoa pioneered the aluminum tank car *years ago.* The accumulated knowledge of this development is yours for the asking.

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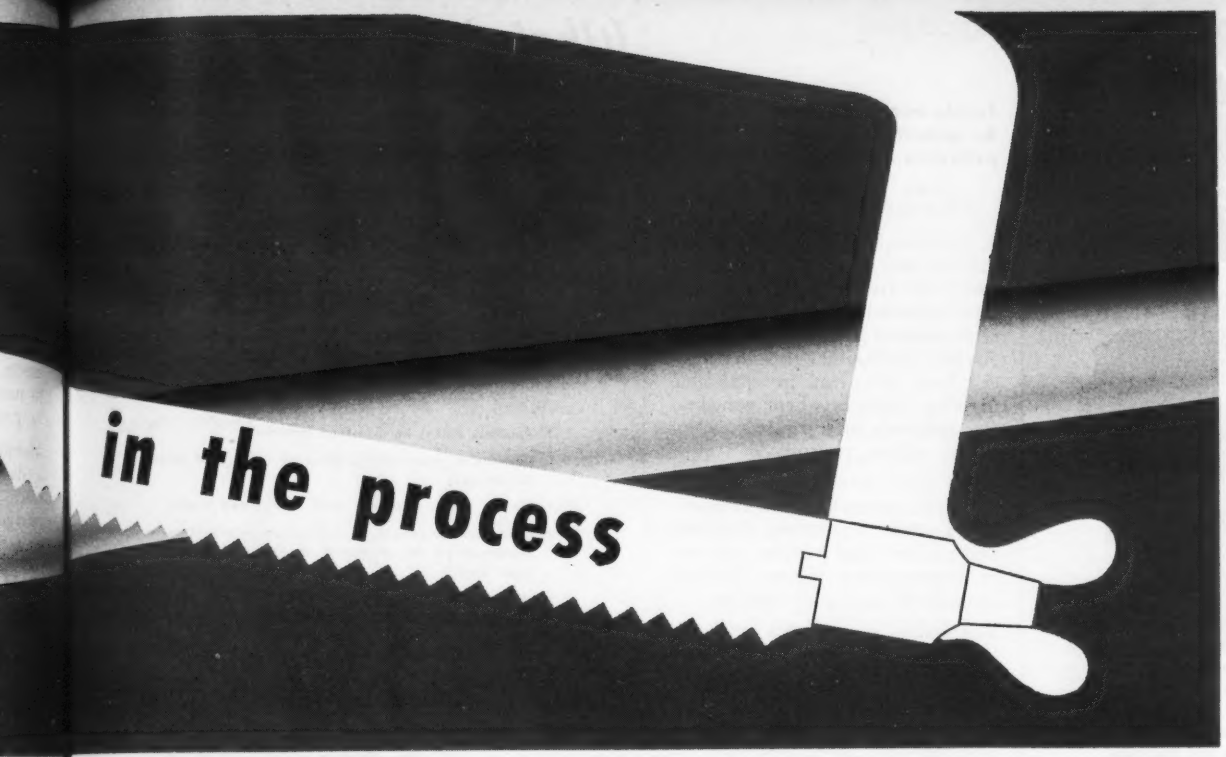
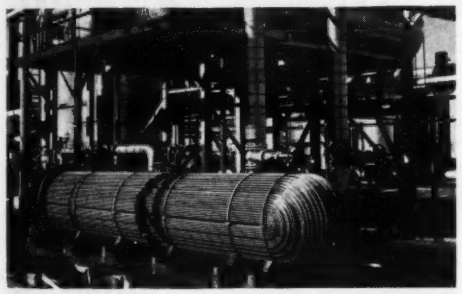
902-F Alcoa Building, Pittsburgh 19, Pa.





Griscom-Russel Re-boiler at El Paso Natural Gas Company, Farmington, New Mexico.

Got corrosion troubles?

So did El Paso Natural Gas Company's desulfurization plant near Kirtland, New Mexico, world's largest gas treating plant. Alloy steel tubing could not withstand the terrific acid conditions there. Result: *to minimize this trouble condenser and heat exchanger tubing throughout the plant is being replaced by aluminum.*

Got cost troubles?

Alcoa Heat Exchanger Tubes cost 1/3 less than mild steel, 1/2 the price of Admiralty, 1/5 as much as stainless. Write for the booklet: "Alcoa Aluminum Heat Exchanger Tubes."

Looking for low cost, corrosion-resistant pipe?

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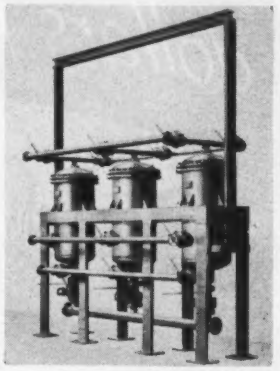
ment as agitated steam-jacketed tanks, flow controllers, or proportioning pumps.



Here is how a two-filter set-up would be connected up. This shows simple precoat feed device in which dry filter aid is slurried with sulfur

Description:
SJF sulfur filter plants are shown in the photograph and drawing with this article. All valves and pipes are steam-jacketed, as is the shell of each filter. The I-beam at the top of the photo is a rail for hoist which lifts the covers from the filters and sets them on the framework between the filters. Covers are removed for inspection of filters only infrequently, however; they are left on during filtering and washing operations. If desired, a separate davit can be built into the framework adjacent to each filter—instead of the hoisting method.

The filters themselves have a 5/16″ inner shell, heavy bolting, and recessed gasketing. They are made in only two sizes — 22 and 26″ diameters — and capacities are built up by adding more filters to the lines in any one packaged plant.

As can be seen at left side of drawing, filter aid precoat is fed into an 8″ steam-jacketed drop pipe with its lower end submerged in the raw sulfur pit.

Mixed by the pump with the incoming sulfur, the filter aid is carried into the filter shell and deposited as a uniform coat on the outer surfaces of the porous carbon tubes. The body coat is applied by the same method. A mechanical feeder can be used to add the dry filter aid to the drop pipe at a constant rate.

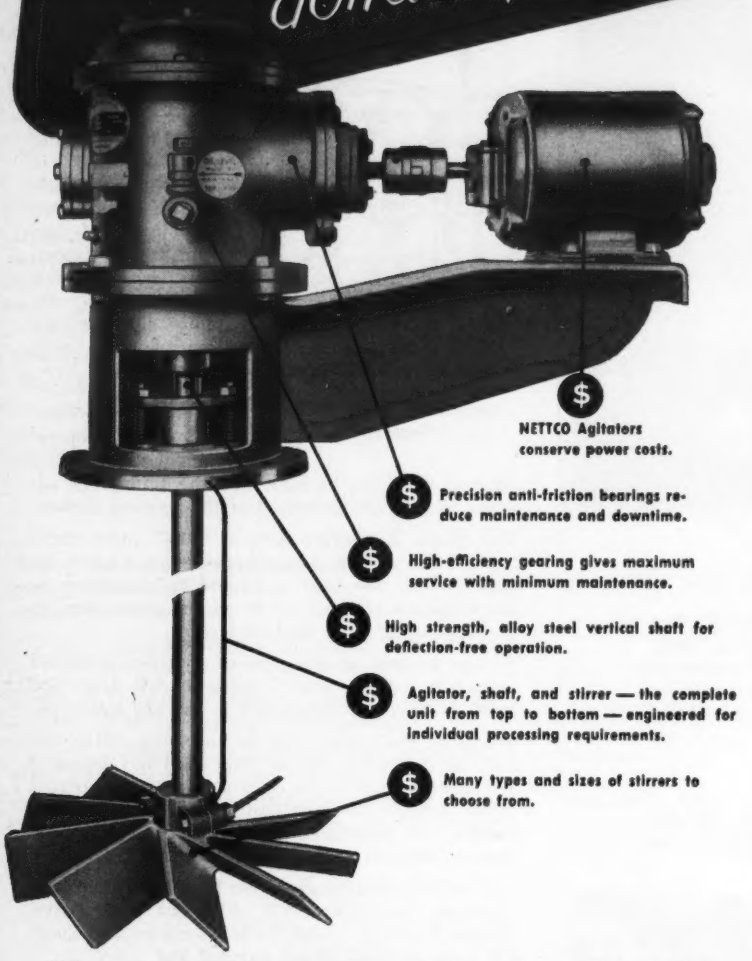
(SJF sulfur filtration plants are built by R. P. Adams Company, Inc., Dept. CP, 225 East Park Drive, Buffalo 17, N. Y. . . . or for more information check CP 1945 on handy form, pages 2 and 3.)

Shows separation equipment for oil seeds and nuts

Photographs, tables, and text of four-page bulletin describe hulling and separation equipment for oil seeds and nuts. Shown, with brief specifications, are a separator-purifier, double and single rotary hull beaters, tailings beater, disc and Chandler knife hullers, and permanent magnetic separator. Methods of operation are briefly covered. Dimensional drawing of a typical installation is on back cover.

Bul 0-4 is issued by The Bauer Bros. Co., Dept. CP, 1728 Sheridan Ave., Springfield, Ohio. When inquiring specify CP 1946 on handy form, pages 2 and 3.

Make your agitator dollars pay!



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We would be very happy to work with you on *your* agitating requirements. Send for complete information, recommendations, quotations. New England Tank & Tower Company, 93 Tileston Street, Everett 49, Mass.

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Foremost in ENGINEERED AGITATION for over half a century

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Feeds non-abrasives by gravity against pressure . . .

rotary valve made primarily for feeding wood chips

A cylindrical rotary feeding device has recently been designed, primarily for feeding wood chips and other ligno-cellulose materials when semi-chemical pulping with the Asplund Defibrator. But the feeder's basic idea may be applicable to other instances where non-abrasive materials must be fed continuously against pressure.

Valve itelf serves as a pressure lock, and material is actually gravity-fed, thus eliminating deformation of individual particles and loss of impregnating liquors through compression and plug-forming.

The valve is mounted with its axis horizontal. Rotor of the valve contains two spherical pockets. Material is fed into the pockets when they are up, and it drops into reaction vessel when rotor turns 180°. Rotor turns in special stuffing box to prevent escape of steam, and is supported by antifriction bearings. Lateral movement is minimized by special mounting arrangement.

Two sizes are available: 15 and 21" in diameter. Last size handles 70 to 100 tons of wood chips (bone dry basis) per 24 hr at 8 to 12 rpm. It operates against steam pressures to 180 psi, and uses 2 to 5 horsepower.

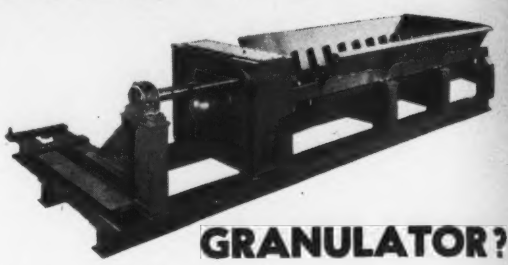
(Rotary Feeder was developed by American Defibrator, Inc., Dept. CP, 405 Lexington Ave., New York 17, N. Y. . . . check CP 1948 on form, pages 2 and 3.)

Filter paper samples are in bulletin

Four-page folder contains samples of industrial filter papers made from either cotton rag clippings or cotton linters. A list includes 24 special purpose grades, and tells, in most cases, where each is used. Separate table indicates thickness, basis weight, filtration rate, and wet strength of the 24 papers.

Bul 16 is issued by Brosites Products Corporation, Dept. CP, 50 Church St., New York 7, N. Y. When inquiring specify CP 1949, pgs. 2 & 3.

What is a



GRANULATOR?

A Chambers Granulator:

1. Receives bulky, hard-to-feed materials;
2. Delivers a granulated product of even, well mixed consistency;
3. Carries many overhead tons of dumped loads;
4. Generates an even feed for continuous processes — manufactured in capacities up to 100 tons per hour; and
5. Mixes (pugs) multiple materials — wet or dry.

These features, according to your purpose, are also provided by Chambers Pug Mills in a wide variety of sizes.

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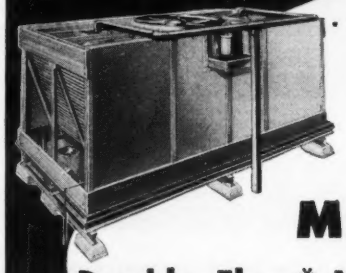
52nd & Media Sts. PHILADELPHIA 31, PA.

Manufacturers of

SPECIAL EXTRUDING MACHINERY

When inquiring check CP 1950 on handy form, pgs. 2-3

The "last word"



. . . in intermediate capacity cooling

MARLEY

Double-Flow* Aquatowers

- Combines the outstanding features of Marley's large Double-Flow and smaller Aquatowers.
- Low silhouette reduces usual tower height up to 66%.
- Available in 8 standard sizes in steel, or wood with asbestos cement board casing.
- For jobs 50 tons and up.

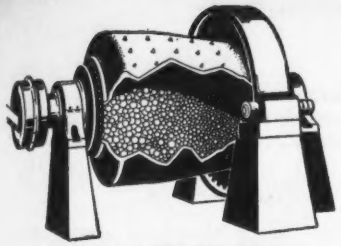
Write for Bulletin DFAQ-52

*Registered trade mark

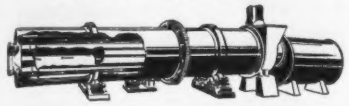
MARLEY

The Marley Company
Kansas City, Missouri

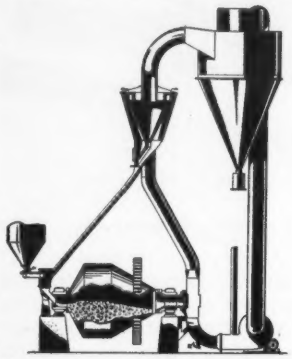
When inquiring check CP 1951 on handy form, pgs. 2-3



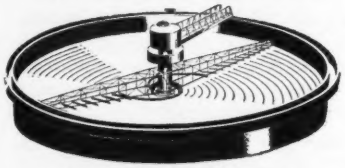
CONICAL & TRICONE MILLS



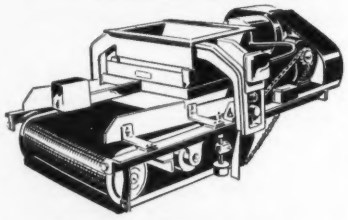
ROTARY DRYERS, KILNS, COOLERS



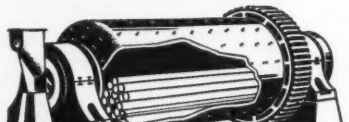
GRINDING & CLASSIFYING SYSTEMS



THICKENERS, CLARIFIERS



CONSTANT-WEIGHT FEEDERS



CYLINDRICAL ROD & BALL MILLS

Write for Bulletin 100-A-13 describing complete Hardinge line.

HARDINGE
COMPANY, INCORPORATED
YORK, PENNSYLVANIA · 240 Arch St. · Main Office and Works
New York · Toronto · Chicago · Hibbing · Houston · Salt Lake City · San Francisco

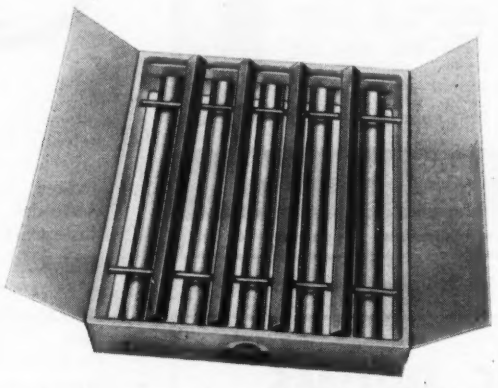
When inquiring check CP 1952 on handy form, pgs. 2-3

No need for electrical wiring, generator equipment with use of grate magnet . . .

fits where space limits use of larger equipment in protecting product, equipment

Uses: To remove iron contamination from many free-flowing materials. Permanent, non-electric grate magnet is to be incorporated in hoppers, floor openings, vertical closed chutes, and wherever space limitations prevent use of larger separator equipment in removing iron particles.

Features: Non-electric unit assures product purity, protects valuable equipment, and aids in elimination of fires and explosions. Separator consists of a series of 1" diameter stainless steel tubes within which are powerful Alnico V magnet castings. Tubes are spaced on 2" centers allowing clear area of 1"



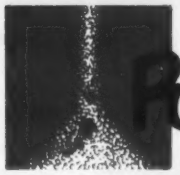
Magnetic separator is rugged, efficient, and easily cleaned with cloth or compressed air

between tubes at narrowest point. Rugged steel grill serves as baffle to slow down materials traveling at too high speeds and directs stream of material onto magnetic tubes.

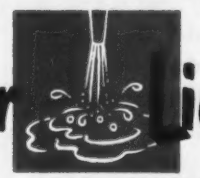
When grate is ready to be cleaned of tramp iron load, grill is lifted from working position. Magnetic tubes can be wiped off with a cloth or blown with compressed air. Unit is easily cleaned since tubes extend full length of assembly without additional obstruction. Frequent cleaning assures maximum protection and efficiency.

Description: Unit frame is constructed from ¼ x 2" hot-rolled steel firmly welded at all corners. On the inside of two sides of the frame, ½ x ⅛" steel grips are spot-welded to provide ledge support for grill. Standard dimensions of grate magnets are in increments of 2" on width starting with 2½" and through 36½", while length starts at 4" in increments of 4" through 36". These dimensions are changeable according to customer's individual requirements. All stainless steel construction is available when required.

(Product of Eriez Manufacturing Co., Dept. CP, 1945 Grove Dr., Erie, Pa. . . . or for more information check CP 1953 on handy form, between pages two and three.)



Powders & Pastes or Liquids



DAY D-10 BLENDER *does a finer, faster job!*

Whether you work with powders, pastes or liquids, you can depend on a DAY D-10 BLENDER to boost production. Scientifically designed agitators insure constant, thorough blending action. Sturdy outboard bearings provide ample support for the agitator shaft, remain free from abrasive action by the material being mixed and also eliminate bearing loads on the stuffing boxes. Heavy-duty design includes a rigid frame that is free from vibration, plain or stainless steel tank and a geared head motor with roller chain drive. Discharge at center or either end is optional. Available with Spiral Ribbon Agitator for paste, semi-paste, granular or liquid products.

DRY COLOR AGITATOR

Optional, supplied when necessary for materials such as heavy-bodied powders.

Call **your J. H. Day Sales Engineer or write for details. The J. H. Day Co., Inc., 1143-A Harrison Ave., Cincinnati 22, Ohio.**

DAY

THE J. H. DAY COMPANY, CINCINNATI 22, OHIO

When inquiring check CP 1954 on handy form, pgs. 2-3

new method of **process heating** and **cooling**

***saves 50%**

- *in initial cost
- *in heating and cooling time
- *in tank space
- *in maintenance labor

Each member of your buying committee should have this book which tells how Platecoils satisfactorily solve tank heating and cooling problems . . . and at the same time save time, money and manpower.

PLATECOIL REPLACES PIPE COILS

Write for your free copy of Bulletin P54 today!

KOLD-HOLD MANUFACTURING CO., LANSING 4, MICH.

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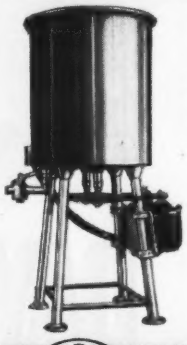
Filpaco **STAINLESS STEEL TANKS**

SPECIAL • SINGLE SHELL • STANDARD

Designed and fabricated to your specifications . . . all shapes and sizes up to 2000 gal. capacity.

Accessories: Agitators, gauges, special covers, special fittings, cooling and heating coils.

Over 15 years' experience and latest fabricating equipment assures you of the right tank for the job.



Write us today concerning your problems. Your inquiries will receive immediate and personal attention by our engineers.

We also manufacture equipment for filtering, filling, mixing, conveying; as well as Filter Paper, Filter cloths and bags.

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The FILTER PAPER CO.
2432 S. Michigan Ave. Chicago 16, Ill.

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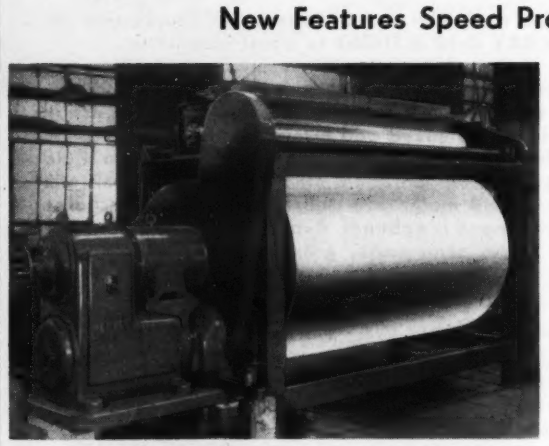
Buflovak FLAKERS & COOLING DRUMS

New Features Speed Production . . . Lower Costs



BUFLOVAK Atmospheric Single Drum Cooler, 5' x 8'5". Used for chilling soap.

A uniform, high quality, finished product . . . more of it . . . and at lower cost . . . are the results of many new BUFLOVAK profit-building features.

BUFLOVAK Flakers are extensively used in the Chemical industries to produce granular or flaked material. This process offers continuous operation, large capacity, and a finished product free from lumps.

BUFLOVAK Flakers are built in open or closed types. The latter eliminates dust and toxic hazards. They are available in several sizes of any suitable material, with individual modifications to suit various applications; such as, steam jacketed, direct fired, or electrically heated feed pans.

The technical staff of BUFLOVAK can help you with your flaking and cooling problems.

You will be sure of better results from BUFLOVAK.

Send for Catalog 352

BLAW-KNOX COMPANY
BUFLOVAK EQUIPMENT DIVISION
1579 Fillmore Ave. Buffalo 11, N.Y.

When inquiring check CP 1957 on handy form, pgs. 2-3

Efficiency of dust precipitators upped by automatic rapping electrode cleaners . . .

solenoid-actuated plunger units require no labor and almost no supervision

Uses: Dust recovery work of an electrostatic precipitator is accomplished chiefly by its electrically charged electrodes. Two sets of electrodes are used: high tension discharging electrodes; and grounded, collecting electrodes that attract dust particles in the gas to their surfaces. All of the dust collected in this way does not fall by gravity into disposal hoppers, some remains on the grounded electrodes. Cleaning units are used to unload this dust which accumulates on the electrodes.

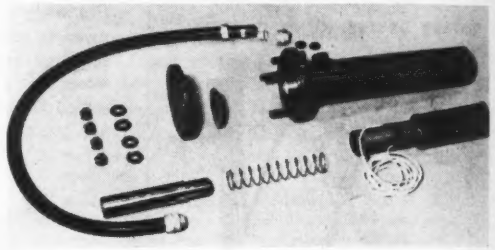


Fig. 1—Basic elements of rapping unit

Features: Rapping electrode cleaners automatically remove the dust from the precipitator electrodes, increasing the efficiency of the dust collection. Cleaning system is self-regulating, requiring no labor and almost no supervision.

Only major moving part of a rapping unit is the solenoid-actuated plunger, which is hermetically sealed and permanently lubricated at the factory. Cleaning service has a low power consumption, only 300 watts or less per precipitator.

Description: Until now most available types of electrode rappers were mechanical or pneumatic. These types are limited to intermittent operation. Electrode cleaning under these conditions was a batch dust removal process. This hampered operation of precipitators, which require continuously clean electrodes for efficient operation. Intermittent electrode cleaning also resulted in objectionable stack emissions of rapping puffs of dust to the atmosphere.

Recently developed method, designated as the MI (magnetic-impulse) rapping system, provides a continuous and uniform dislodging service. These units deliver continuous rapping impacts of light and automatically controlled intensities.

Up to 24 rappers can be energized by the same power circuit. Central pulse generator delivers tripping impulses to each of the rapping units so that the entire precipitator is rapped in 60 seconds or less. Separate remote control device permits monitoring of the rappers from any convenient plant location, eliminating the need for regular operating personnel. Since equipment does not cause rapping puffs, plant and community relations are improved.

The MI rapping case contains the solenoid-actuated plunger and its elements. Case is welded to the end

of a horizontal rapper bar protruding through the precipitator wall and stuffing box. Collecting plate-electrodes in the precipitator are grouped into banks. Horizontal rapper is welded along the edges of these banks. Each bank is rapped in sequence to remove dust.

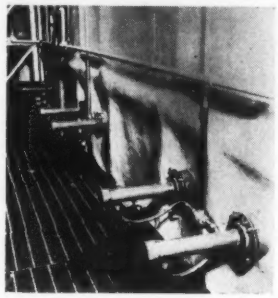


Fig. 2—Six rapping units are shown in this precipitator installation

High-tension discharge electrodes in Cottrell electrostatic precipitators require less rapping to keep them clean. Rapping units for this service can be energized by same power source that activates the collecting plate rappers. Other rapping methods require separate power sources for discharge and collecting plate rapping services.

(Developed by Research Corp., Dept. CP, Bound Brook, N. J. . . . or for more information check CP 1958 on handy form, pages 2 and 3.)

Filter medium is made from chemically inert Kel-F . . .

porous discs can be used at temps up to 300°F, have mean pore opening of 15 microns

Uses: Fluids filtration.

Features: Completely resistant to all strong acids, caustics, oxidizing agents and common organic solvents, including fuming nitric acid, hydrofluoric acid, concentrated sulfuric and hydrochloric, aqua regia, hydrogen peroxide.

Desription: Filter medium is pure porous Kel-F (M. W. Kellogg's Polychlorotrifluoroethylene). It can be used at temperatures up to 300°F, has an ultimate tensile strength of 900 psi and a modulus of elasticity of 1800 psi. Mean pore opening is 15 microns. Flow capacities range downward from 500 cfm of air per sq ft of filter surface, at 8 psi differential pressure, and from 110 gpm of water per sq ft, at 10 psi.

Porous Kel-F is now available in discs up to 12" diameter, in thicknesses of 1/16 and 1/8", and with solid Kel-F edges which are chip-proof. Complete fabricated filters using the medium are now reaching the final development stages.

(Announced by Porous Plastic Filter Co., Dept. CP, 30 Sea Cliff Ave., Glen Cove, N. Y. . . . or for more information check CP 1959 on handy form, pages 2 and 3.)

Vapor pressures of esters at various temperatures — nomograph on page 204.

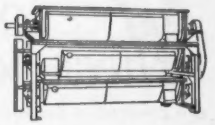
We are Good Mixers

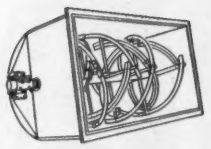
SPROUT-WALDRON EQUIPMENT and SYSTEMS for

- Continuous Mixing
- Batch Mixing
- Blending

Sprout-Waldron specializes in *all types* of equipment for intimate mixing or blending* of *all types* of dry or semi-dry materials. Sprout-Waldron's batch mixers range from midget 2½-cubic-feet units to giants of 1500 cubic feet and more. And continuous mixers can be designed with almost unlimited capacities. The wide variety of the standard units spans an equally wide field of applications. To further widen their range of uses, the standard units can be "adaptioneered" for your specific requirements. They can be made of steel, stainless steel, non-ferrous metals or wood, lined with glass or porcelain, jacketed for heating or cooling, and equipped with a wide array of agitators and other accessories. Finally, the units can be combined in series, to perform complex "unit operations."

Sprout-Waldron's wide range of styles and sizes plus "adaptioneering" methods offer you many opportunities to select a machine that will reduce mixing cycles, save labor and floor space, and cut horsepower. Why not benefit from Sprout-Waldron's vast experience in "adaptioneering" equipment for *your* processing industry? Learn how it can help to modernize *your* mixing operations, improve efficiency in *your* plant. Write to: Sprout-Waldron & Co., Inc., 10 Logan St., Muncy, Pennsylvania.





*In Sprout-Waldron's dictionary, blending is more than mixing. If you really want to blend two or more materials, thus completely losing their respective identities, Sprout-Waldron can show you how. Ask for details!

SPROUT-WALDRON
Manufacturing Engineers
MUNCY • PENNSYLVANIA

MODERN EQUIPMENT FOR: Size Reduction • Mixing and Blending • Bulk Materials Handling • Product Classification • Pelleting & Cubing

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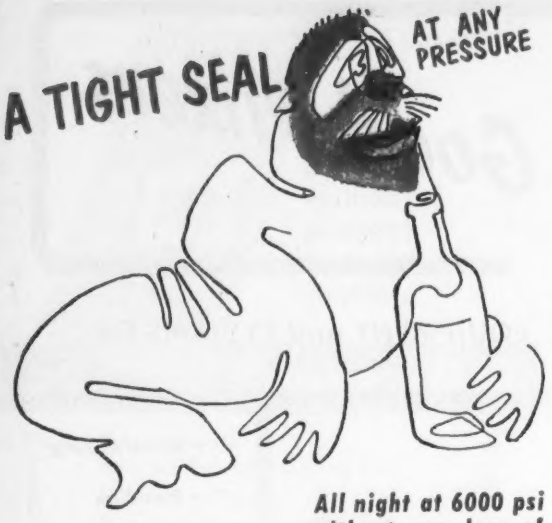
A TIGHT SEAL AT ANY PRESSURE



All night at 6000 psi without any loss of gage pressure.

This and other • Shear-Seal CHARACTERISTICS are covered in Bulletin BVM-2

• Low Handle Load
• Not Critical to Dirt
• Excellent Throttling
• No Wire Drawing
• High Flow Capacity
• Low Maintenance

MANUAL VALVES

Vacuum to 6000 psi

pipe sizes to 1 ½ inch

. . . come in the following flow patterns: Shut-off, Manipulator, Four-Way Selector, and Dual Pressure Selector.

For complete technical information see our catalog in Sweet's 1953 File for Product Designers and in the Plant Engineer's File, or write for Catalog 2B-S on Manual Valves and Catalog 1B-2 on Solenoid Valves.

BARKSDALE VALVES

1566 E. SLAUSON AVE., LOS ANGELES 11, CALIF.

When inquiring check CP 1961 on handy form, pgs. 2-3

Briefs . . . from contemporary publications

Here's a quick look at interesting articles appearing in other publications, . . . as selected by Technical Editor, Harry McCormack

Products of hydrogenation of carbon monoxide over an iron catalyst

Three papers on this and related topics present the experimental work and some of the results attained. Apparatus and operating procedures are briefly described. Papers are essentially concerned with the identification of the products synthesized. Some speculations included as to why synthesis occurred as found. 24 pages, 11 tables, 16 figures. (*"Industrial and Engineering Chemistry," February 1953, pages 343 to 367.)*

Efficient handling accelerates 'in and out' warehousing

Article describes the path of materials from receiving door to various operations and departments. Tells how conveying operations must be coordinated with varied materials to be conveyed. 2 pages, 7 photos. (*"Flow," January* 1953, *page* sixty-eight)

Use of plant nutrients

Authors comment on the amount of each of the three nutrient materials present in today's fertilizers and state opinions as to what it would be in '54 — '55. Tabulate estimated total consumption of primary nutrient materials as mixed fertilizers in 1954-55. Enumerate the advantages to the consumer which would accrue from the production of fertilizers with a higher nutrient level. 5 pages, 8 tables. (*"Agricultural Chemicals," January* 1953, *page* 36)

Determination of lactic acid in corn steep liquor

Author comments on the origin of this material, on some of its uses and the importance of knowing its lactic acid content. Certain compounds interfere and must be removed. Procedures are stated. Two modifications of method are compared. 2½ pages, 3 tables, 1 figure. (*"Analytical Chemistry," March* 1953, *page* 505)

Modern tube still design

Stated objective: to present the various factors influencing the design of tube stills in which both radiant and convection heating are used. Chief features discussed: calculation of radiant surface, calculating convection surface, pressure drop and temperature gradient. Contains calculations covering all the elements of heat transfer in the tube still. 10 pages, 6 figures, numerous tabulations and calculations. (*"Transactions of the Institution of Chemical Engineers Vol* 28," 56 *Victoria St., Westminster, London S. W.* 1, *page* 4)

Tanks for everything

Article describes the various plastic materials and processing used in tank production. Capacities from a few gallons up to 535 made by one manufacturer. Construction of multi-segment tanks described which may be of larger capacity. Lighter than customary metal tanks of same capacity and corrosion resistant. 4 pages, 13 photos. (*"Modern Plastics," February* 1953, *page* 100)

Soil resistivity measurements for corrosion control

Discusses factors affecting soil corrosion and methods of determining soil corrosivity. States that surveys should be made in both winter and summer, tells why. Tabulates relatonships of soil resistivity — corrosion. Consideration should also be given to resistivities in adjacent areas. Comments on the use of soil resistivity measurements in cathodic protection work. 3 pages. (*"Corrosion," December* 1952, *page* 407)

Industrial fluoro-chemicals

Author presents an excellent picture of the development and present status of fluorocarbons. Several tables state properties of many of these compounds. "Highly fluorinated materials are characterized by combinations of properties which make them unique; unusual chemical and thermal stability; very low surface tension; low indices of refraction; low dielectric constants; high densities and non-inflammability." 6 pages, 9 tables, 3 figures, and bibliography. (*"Industrial and Engineering Chemistry," January* 1953, *page* 99)

Determination of water: Fischer method

Article describes the apparatus and techniques to be applied to a wide variety of materials to determine their water content by Fischer's method. States some interfering chemicals. Tabulates 54 materials and tells necessary modification of method for this specific material. Tabulates

amount of water added and amount of water found as check on accuracy of method. 8 pages, 1 page bibliography, 4 figures, 2 tables. (*"Chemie et Industrie," December* 1952, *page* 871)

Stiffness of paper

Authors describe an instrument developed to determine the stiffness of paper. Interpret their meaning of the term *stiffness.* Give quantitative data on eight types of paper, determined on samples of different lengths and widths. 7 pages, 6 tables, 4 figures. (*"Journal of Research National Bureau of Standards," December* 1952, *page* 385)

Oxygen recorders: principles and applications

Author discusses applications in the field of fuel combustion. Presents some charts and a nomograph. Describes six of the better known and more widely used oxygen recorders and states principles of operation. Discusses the importance of a proper, sampling system irrespective of the type of analyzer-recorder used. 6 pages, 13 figures. *("Instruments," February 1953, page 248.)*

Ethylene oxide by direct oxidation

A new process is described wherein ethylene is oxidized directly to ethylene oxide. Equipment is also described. Schematic drawing shows units and their sequence. Economics of process are presented briefly. No dimensions on equipment. No operating data. 3 pages, 1 figure, 2 photos. *("Petroleum Refiner," February 1953, page 87.)*

High temperature, high pressure pipe

A new wall thickness formula. Article is a condensation of a committee report to the American Standards Association on this topic. States that thirty one formulas were considered. Discusses the development of the new wall thickness formula. New formula is given with reasons for its recommendation. 4 pages, 5 figures. (*"Heating, Piping and Air Conditioning," January* 1953, *page* 128)

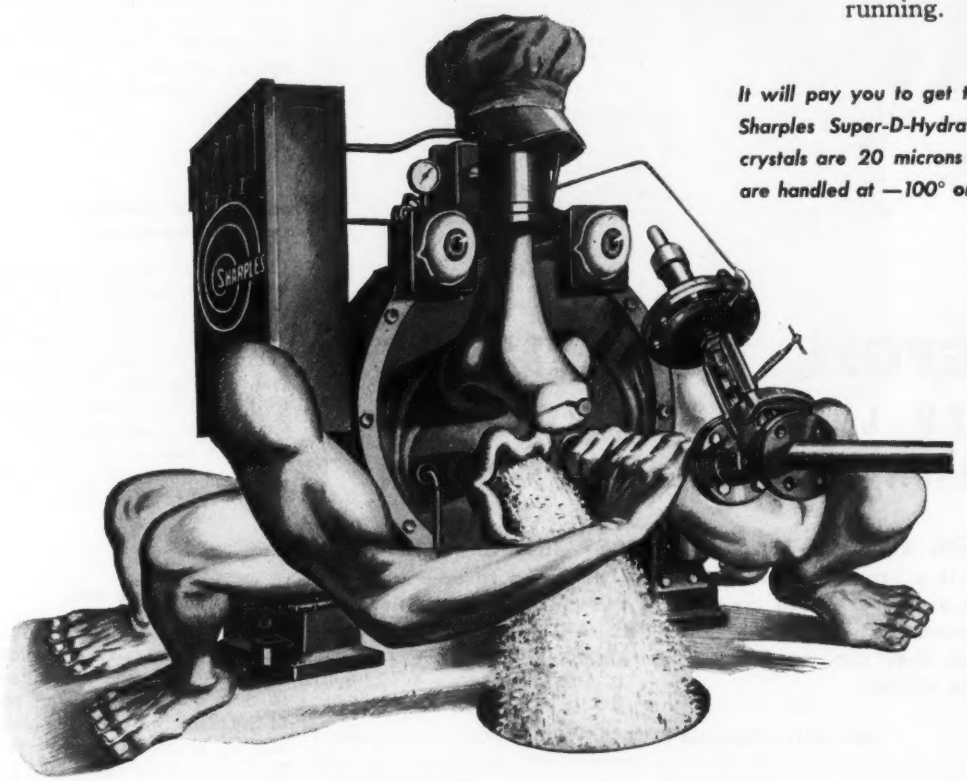
Design of commercial continuous reactor systems

Author contends that the pilot plant data secured in batch operations may be used as background data for design of continuous reactor systems. Assumes a problem, then presents its solution. 9 pages, 8 figures, 3 tables, 2 pages discussion. (*"Chemical Engineering Progress," January* 1953, *page* 26)

Built ruggedly for tough crystal dehydration service—that's the reason why performance records of over 200 Super-D-Hydrators show low operating costs and high purity dry crystals. Every detail has been engineered to withstand the most severe operating conditions. Oversize bearings, heavy duty basket, rugged knife and leveller, all combine to give dependable continuous service.

The Super-D-Hydrator is extremely flexible. Instrumentation control provides quick, easy adjustment for variations in slurry concentration, flow rate, and crystal size —independently, and while the machine is running.

BRUTE FOR CRYSTALS



It will pay you to get the facts about The Sharples Super-D-Hydrator — whether the crystals are 20 microns or 4 mesh in size, are handled at —100° or 400° F.

Just write Sharples.

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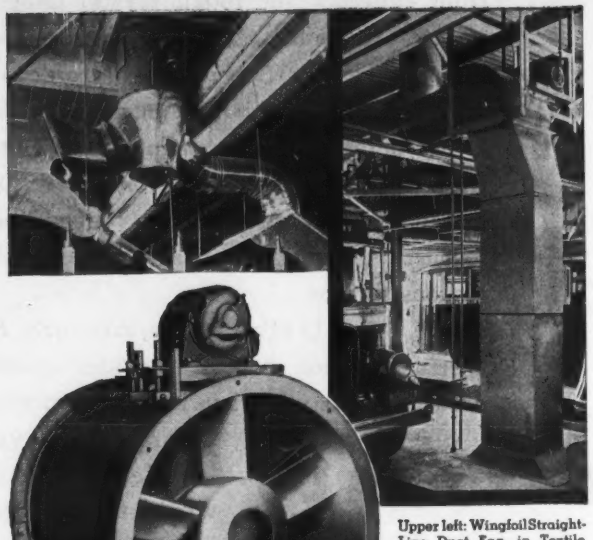
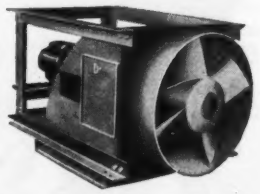
When inquiring check CP 1962 on handy form, pgs. 2-3



Upper left: Wingfoil Straight-Line Duct Fan in Textile Mill. Upper right: Wingfoil Elbow Type Duct Fan exhausting gases in a Garage.

Wingfoil Straight-Line Duct Fan



Wingfoil Elbow Type Duct Fan

WINGFOIL DUCT FANS

DELIVER LARGE AIR VOLUMES WITH LOW POWER CONSUMPTION

The WINGFOIL Axial Flow Duct Fan, in either elbow or straight line type, is a compact, economical fan, designed to operate against static pressure. Both types have the motor outside the casing, unaffected by hot or dirty gases. Light weight, compact, easily handled, they may be inserted, as elbow or straight section, into a line of duct.

Write for Bulletin F-10

Wing

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Factories:
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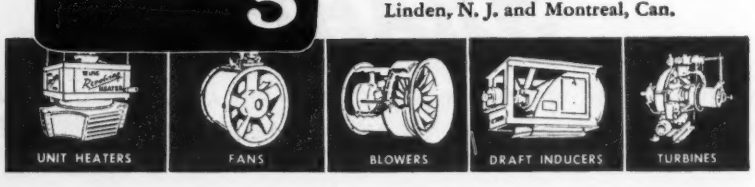


When inquiring check CP 1963 on handy form, pgs. 2-3

BRIEFS

Coatings for steel water pipes

Author says, "The purpose of this paper is to assemble and summarize present knowledge on the subject of available coating materials, their effectiveness, and their approximate cost of application." Emphasizes the importance of securing certain data regarding the soil and water conditions surrounding the pipe line. 10 pages, 5 tables. (*"Journal of American Water Works Association," February 1953, page 103.)*

Strength of conical vessels subject to external pressure

A critical examination has been made of available formulas for calculating collapsing pressures of conical closures subject to external pressures. These were thought to be inadequate and a more suitable formula is proposed which is based on experimental measurements. Five pages, eleven figures, one table. (*"Transactions of the Institution of Chemical Engineers, London, Vol* 30," *page* 65)

Production of fertilizer from phosphate rock

Objective of the investigation was to produce a fertilizer containing appreciable percentages of available phosphate, potassium, and magnesium. Process was essentially, therefore, one of fusing phosphate rock with a potassium magnesium mineral. Preliminary study was encouraging and led to the construction and operation of a pilot plant. Construction, operation and operating results of the pilot plant are stated. 6 pages, 9 figures, 6 tables. (*"Industrial and Engineering Chemistry," March* 1953, *page* 646)

Antioxidant properties of phenols

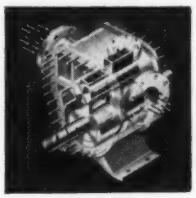
As effected by alkyl substitution. Investigation concerned with the antioxidant properties as related to various petroleum products. Properties of the phenols used are tabulated. Life of various oils in oxidation tests were determined when 0.1% of various substituted phenols were added. Effects of various compounds stated in life-hours of the oil. 2½ pages, 1 table, 2 figures. (*"Industrial and Engineering Chemistry," January* 1953, *page* 192)

Motion study of solid particles in a hydraulic cyclone

Using an optical method, tangential velocity components of fine aluminum particles were measured directly at selected positions within a transparent hydraulic cyclone. Equipment, methods of measurement, and the deductions made from these

ROTARY POSITIVE DISPLACEMENT PUMPS

When liquids must be handled at fixed rates of flow, it pays to install a Kinney Rotary Liquid Pump. These are furnished in two basic designs — the famous Model SD Rotating Plunger Pump and the unique Model HQ Heliquad Rotary Pump. Each design has specific advantages which make it the "pump of choice" for certain services. For instance, in barge and tanker service, the Kinney Model HQ Pump has the unusual ability of handling all viscosities from gasoline to heavy molasses. For handling viscous materials such as asphalt, grease, soap, etc., the Kinney Model SD is the outstanding favorite.



Kinney SD Rotating Plunger Pump.

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Tell us about your process pumping problems. We will gladly give you full details on Kinney Rotary Positive Displacement Pumps. Kinney Manufacturing Co., manufacturers of liquid and vacuum pumps. Representatives throughout the United States and in foreign countries.

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Please send Bulletin L51 describing Kinney Rotary Liquid Pumps.

NAME.....

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measurements are stated. 21 pages, 28 figures, 5 pages of discussion. (*"Transaction Institution of Chemical Engineers, London — Vol* 30," *page* 87)

Ammonia synthesis gas

Authors describe the purification of ammonia synthesis gas by washing with low temperature nitrogen. Process is said to be a very flexible and with wide applications. A few of the applications to hydrogen rich streams have been outlined. Approximate investment figures and utility requirements are given. 4 pages, 2 figures, 2 tables. (*"Petroleum Refiner," February 1953, page ninety-nine.*)

Analysis of synthesis gas

Rapid and highly accurate method. Gas referred to consists of carbon dioxide, carbon monoxide, hydrogen, and methane. Apparatus used and the method employed are described. Synthetic samples of known composition were prepared and analyzed to check accuracy of method. Results tabulated. 3½ pages, 2 figures, 1 table. (*"Analytical Chemistry," February* 1953, *page* 256)

Plastic pipe handles salt water

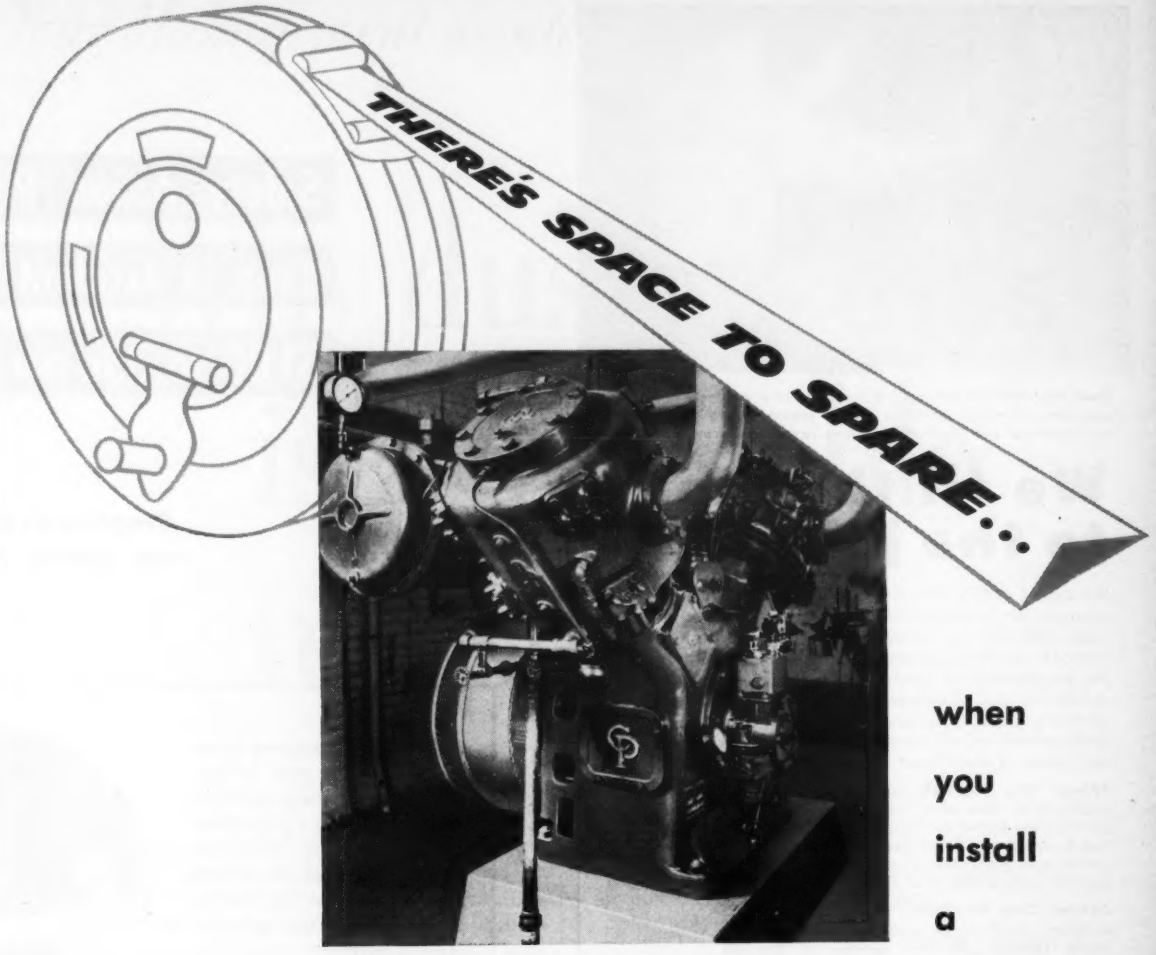
Author describes the kind of plastic pipe used in disposing of salt water from an oil field. Techniques necessary in joining pipe lengths and lowering into well are stated. Physical tests on pipe are given and on basis of these, maximum length of pipe is recommended. 2 pages, 4 photos, 1 figure. (*"The Petroleum Engineer," March* 1953, *page B-64*)

Cottonseed oil iodine values

Influence of variety and environment. Study extended through three seasons at 13 stations and involved 9 varieties. The three year mean is computed for each variety and locality. Influence of mean temperature during the growing season is commented on. 3 pages, 5 tables, 1 graph. (*"Journal of American Oil Chemists Society," March* '53, *page* 120)

Bark removal from chips and wood pulp

Paper describes two developments, one designed to remove bark from wood chips, the other to remove bark and dirt from pulp. Each device and its application discussed and the results attained when working to the desired objective are tabulated. 5 pages, 3 tables, 3 figures. (*"Paper Trade Journal," December* 1952, *page* 23)



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The highly efficient Type Y Compressor has roller main bearings, precision connecting rod bearings, multi-step capacity regulation, and an easy-to-clean shell-and-tube intercooler.

Available in sizes from 75 hp to 250 hp, 410 cfm. to 1663 cfm., and with flange mounted, belted and coupled motors. Write for Bulletin 766. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

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Case No. 207: Handling sharp edged metal products in hot acid solutions. Correctly job-fitted gloves reduced hand injuries 78% and saved 6c per man-hour on glove replacement cost.

We fit the glove to the job . . .

Savings of 40% to 70% of glove costs to employees or management, and comparable reductions in hand injuries, are being effected by replacing old-type work gloves with Edmont coated gloves designed for the job condition. With the cooperation of America's largest industries we have developed and test-rated gloves for any combination of service requirements listed below. Tell us your operation. Without cost we will send test samples of the correct glove, and name of distributor who can supply you.

Edmont Case No. 208: Handling explosives in fibre cases. *Job-fitted* gloves, palm-coated with rough textured natural rubber, outwore leather palm gloves 3 to 1 and gave positive non-slip grip at all times.

Edmont Case No. 419: Chemical company working in acids and strong solvents. *Job-fitted* gloves coated with NEOX (specially reinforced neoprene) outwore rubber coated gloves more than 4 to 1.

Edmont Case No. 272: Handling thin strips of stainless steel. *Job-fitted* gloves, palm-coated with cut-resisting reinforced neoprene, wore 8 times longer than canvas gloves (224 hours vs. 28 hours) with comparably greater protection.

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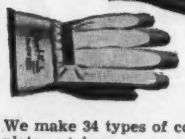

Rough-Finish
Natural
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Abrasion Resistance
Cutting Resistance
Snagging Resistance
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Wet Grip
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Acids:
Sulphuric—98%
Sulphuric—10%
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Nitric—10%
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We make 34 types of coated industrial gloves. Complete catalog on request. Address Edmont Manufacturing Co., 1204 Walnut Street, Coshocton, Ohio.

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Edmont job-fitted gloves
Largest selling line. Supplied by leading industrial distributors

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Safety Action Plus Six Years Equals Drop in Accident Costs from $1.00 to 33c per $100.00 of Payroll

safety

Program at paper mill has been responsible for cutting accident frequency rate 70%

Chlorine gas escaping from the processing tank drifted down a passageway between two buildings at a paper and pulp processing plant. In one building, about 25 office employes of the plant's power engineering and piping department were at work.

The choking fumes were detected by a plant safety inspector making his rounds. He sounded an alarm for employes in the building and went on to locate the source of the trouble—a pulley belt had slipped from the shaft of an agitator tank in which hypochlorite bleach was being made. Although the heavier-than-air gas blocked all exits, every employe in the building escaped to a safe area without harm. Their escape was made possible through the foresight of the firm's safety and plant protection department which had provided a supply of small respirators (see the accompanying photograph) to safeguard occupants of the building against chlorine gas.

Here is a cabinet of pocket-type respirators which several employes used to escape from office building when chlorine gas contaminated atmosphere recently

THIS recent incident typifies the comprehensive safety program which has been developed at the Luke, Maryland plant of the West Virginia Pulp and Paper Co. Program has been responsible for cutting the accident frequency rate at the plant 70% in six years and has reduced the "cost of accidents" from more than $1 per $100 of payroll in 1945 to 33c in 1951 — accident costs being based on medical, legal, hospital and compensation expenses.

In addition, during the first six months of 1952, the accident frequency rate was even lower than it was the previous year. And the "cost of accident" figure dropped to 17c per $100 of payroll in that period.

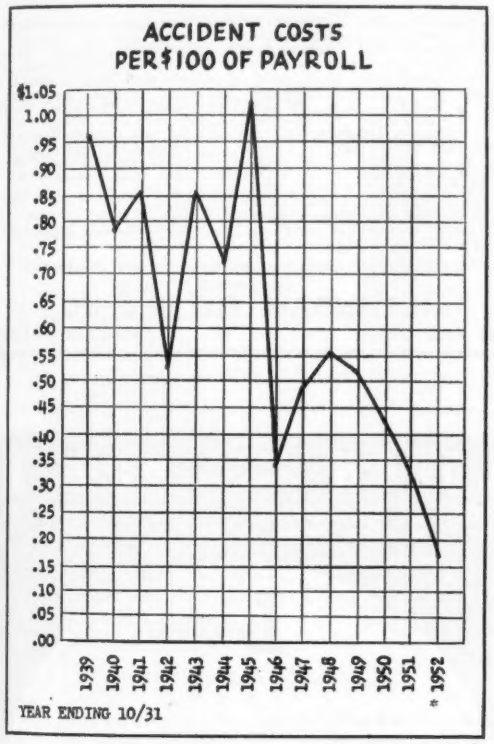
Previous Conditions

In 1947, the safety record was bad. During 1946, (based on company's fiscal year from Oct. 31, 1945 to Nov. 1, 1946), an average of 18.4 lost-time injuries occurred for every million man-hours worked. For several prior years, the record had not been much better. It averaged around 15 or 16 lost-time injuries. Improvement since 1946 was 5.08 and in first 6 months of 1952 it reached 3.6.

Program

Four factors characterize the Luke's plant accident reduction and general safety, fire and plant protection efforts:

1. Decentralization of responsibility for accident and fire prevention to departmental foremen and line supervisors
2. Emphasis on employe training in the "safe way" to do each job
3. Interest and cooperation of the union
4. Stimulation of interest in safety outside the plant, as well as inside



* (AS OF APRIL-1952)

A 12-member mill safety committee was organized at top management level, headed by the general manager. Every division superintendent was named a member. Each superintendent then was made responsible for organizing regular safety meetings among the supervisors in his division. The supervisors, in turn, organized safety committees in their respective departments, the manner in which meetings were to be held being whatever way was most feasible—tool box sessions, general department-wide meetings or shift committees. At these meetings, problems pertinent to individual operations are discussed.

While such a large number of individual committees may seem unwieldy, the delegation of functional responsibility to at least 100 men has stimulated interest and cooperation in safety.

(*Continued on next page*)

Your Management wants to know...

Why dust recovery is a profitable investment

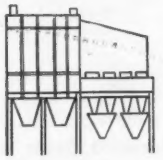
Nineteen years ago, our engineers developed what we think is the most workable way of solving the Dust Recovery problem. It was the formation of "dust recovery teams", consisting of Buell engineers and the plant engineer—the man who knows his particular dust problem better than anyone else.

This team, drawing on the experience and background of Buell, coupled with the plant engineer's intimate knowledge of his own problem, brought about the kind of results industry has been seeking: substantial profit increase, improved product and/or process, better employee morale.

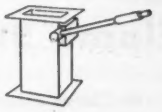
To learn more about Buell's **3 basic systems** of Dust Collection, Buell's Team-up with the Plant Engineer and how they can work for you—send for the new informative booklet entitled, "The Collection and Recovery of Industrial Dusts". Buell Engineering Co., Dept. 11-F, 70 Pine Street, New York 5, N. Y.

VAN TONGEREN CYCLONE

'SF' ELECTRIC PRECIPITATOR


PRECIPITATOR—CYCLONE COMBINATION

TYPE 'LR' COLLECTOR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ENGINEERED EFFICIENCY IN DUST RECOVERY

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TAKE EVERY PRECAUTION...

TO SAVE PRICELESS VISION!

The HAWS Eye-Wash Fountain makes it possible for the worker himself to safely, easily wash injurious chemicals and foreign matter from the eyes before medical aid can be at hand. Has the potentiality of saving vision, reducing insurance claims.

AND to *prevent* dangerous and expensive eye accidents, encourage workers to wear goggles and plastic face shields by installing a HAWS Goggle-Wash Fountain—eliminates one of workers' main objections to wearing these safety devices.

"Precaution" is really the cheapest thing you can buy!
HAWS Safety Equipment costs only a few cents per worker.
Write for literature today!

HAWS DRINKING FAUCET CO.
1443 FOURTH STREET (Since 1909) BERKELEY 10, CALIFORNIA

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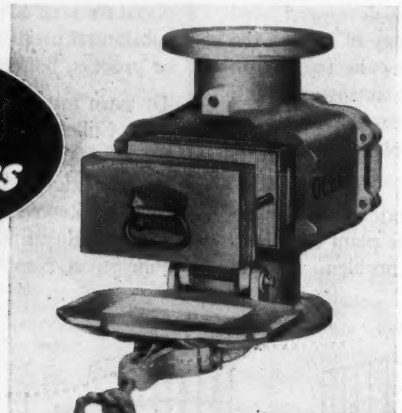
OCECO *Flame Arrestors*

are a

DEPENDABLE

Flame Stop



● These arrestors combine the desired flame stoppage and explosion prevention with minimum pressure drop. Sturdy, rugged semi-steel housings and covers. Corrosion resistant aluminum "banks" have vertical straight through passages, minimizing clogging and simplifying inspection;— extensible for easy cleaning. 2" to 10" sizes. *Write for Bulletin No. 471-R. It gives full details.*

OCECO TANK FITTINGS
THE JOHNSTON & JENNINGS CO.
division of PETTIBONE MULLIKEN CORP.
4751 West Division St. • Chicago 51, Illinois

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(Continued from preceding page)

The plant has a full-time safety inspector and a full-time fire inspector who make daily reports on their tours of the mill.

All members of the guard force are required to fill out daily reports, which indicate their safety and housekeeping observations.

Department supervisors are responsible for making detailed reports on all accidents involving injury in their departments. These reports not only spotlight the direct cause of the accident but require that remedial action be taken immediately to eliminate any possibility of the accident reoccurring.

Prompt action in correcting safety hazards by the maintenance section of the mill is credited with helping to reduce accidents.

Unless such cooperation is obtained, all the training given to employes in how to recognize hazards is futile. The importance of employe participation in a safety program is emphasized by the fact that less than one-third of all injury-accidents at Luke are traceable to "unsafe conditions."

Program Promotion

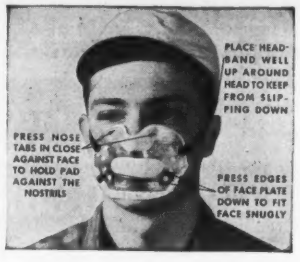
Enthusiasm in safety at Luke is developed through many media—posters, monthly newsletters, intraplant competition, direct mail letters to employes' homes, movies, live demonstrations, prepared safety tests, annual dinners, individual safety award pins and other promotional efforts to stimulate the workers' interest.

A weekly safety poster contest has proved highly successful in building interest. Each week, a miniature safety poster with a pertinent slogan is inserted in all pay envelopes.

Next, a safety committeeman will draw the name of one employe from a barrel in the safety office. The employe is then contacted on his job. If he has the slogan insert on his person and has memorized it, if he is wearing safety shoes (on a job requiring them), if he can tell the number of consecutive days the mill has completed without a disabling injury (the figure is prominently displayed at the main gate), and if his department has not had a disabling injury to any worker during the current year, then the employe wins a cash jackpot.

MARTINDALE

PROTECTIVE MASKS


PLACE HEADBAND WELL UP AROUND HEAD TO KEEP FROM SLIPPING DOWN
PRESS NOSE TABS IN CLOSE AGAINST FACE TO HOLD PAD AGAINST THE NOSTRILS
PRESS EDGES OF FACE PLATE DOWN TO FIT FACE SNUGLY

Weigh less than ½ ounce
Furnish excellent protection against many non-toxic dusts. Replaceable cotton pads are inexpensive and quickly changed.

Masks	.30 each
No. 1 Refills	.02 each
No. 2 Refills-heavy	.025 each

Quantity Discounts

Less than $10.00 List	Net
$10.00 to $24.99	10%
$25.00 to $99.99	15%
$100.00 or over	20%

Minimum, charge or C.O.D. $2.00
Minimum, Cash with Order $1.00
If payment accompanies order we will pay delivery charges.

RECIPRO-TOOL

Permanently engraves letters, numbers, symbols, etc. on practically any hard or semi-hard material such as glass, ceramics, plastics, stone, wood, iron, brass, aluminum, etc. This powerful tool is ruggedly constructed. Easy to operate. Made for 115 volts, 60 cycle A.C. current only.

With hardened alloy bit $19.50

With diamond tipped bit $22.75

Send for latest catalog of maintenance and production equipment.

MARTINDALE ELECTRIC CO.
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LOGAN AIR AND HYDRAULIC POWER

SPEEDS • COORDINATES • REFINES PRODUCTION
IN OVER 10,000 INDUSTRIAL PLANTS

Logan
AIR CONTROL VALVES • AIR CYLINDERS • AIR-DRAULIC CYLINDERS • AIR and HYDRAULIC PRESSES • COLLET GRIP TUBE FITTINGS • SWIVEL PIPING • SURE-FLOW COOLANT UNITS • HYDRAULIC POWER UNITS • HYDRAULIC CYLINDERS • HYDRAULIC CONTROL VALVES • AIR CHUCKS
ROTATING AND NONROTATING AIR CYLINDERS
NONROTATING—7 STANDARD MOUNTING TYPES
Standard sizes from 1½" to 16" bore; maximum stroke, 18'. Special models to meet your requirements. Logan features larger ports, sturdier construction, maximum power without leakage, permanent seal around piston rod.
ROTATING
Two standard styles—Type R with cast iron body; Type K with lightweight aluminum body. Bore 1½" to 20" stroke 1" to 2". Longer strokes special.
SAVES TIME Logan AIR AND HYDRAULIC EQUIPMENT EFFORT • MOTION

LOGAN MANUFACTURES 6,975 STANDARD CATALOGED ITEMS • CATALOG ON REQUEST
Consult Logan for your Special Heavy Duty, Mill Type Cylinder requirements.

LOGANSPORT MACHINE CO., INC.
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HERE'S REAL PROTECTION

plus long-wearing economy

Sawyer **protective clothing is**

- **Highly resistant to all common chemical solutions**
- **Not affected by grease, oil or gasoline**
- **Positively will not crack, blister or peel**

All Sawyer protective clothing is made with top quality base fabric *saturation-coated* with 6 coats of genuine DuPont Neoprene Latex*. It's tough as mule-hide, too . . . takes endless rubbing, scraping, snagging and still gives full protection.

Also: Three-quarter and long coats, coveralls, aprons and many other styles. All clothing made in black and yellow.

*Sawyer fabrics are coated by The Brunsene Company, a division of

THE H. M. SAWYER & SON CO.

FROG BRAND

CAMBRIDGE MASSACHUSETTS

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Simultaneously, a safety supervisor telephones the employe's home. If his wife or mother knows the safety slogan or the number of days the mill has completed without a lost-time accident, she too receives a cash award.

Off-The-Job Safety

Believing that wives and mothers of employes can be helpful in cutting down plant accidents, a direct mail campaign is conducted for them. In periodical letters, it is called to their attention that men engaged in hazardous work need clear and undisturbed minds to avoid injuries. The help of these relatives is solicited to encourage husbands or sons to be careful on their jobs.

The company recently began organizing "Home Safety Committees" in all nearby communities. Members enrolled include employes, their families, and neighbors. Each is given a membership certificate, receives a monthly bulletin and attends a

monthly or quarterly meeting. Interest in attending the meetings is stimulated by arranging for special entertainment, movies, and door prizes.

This "off-the-job" safety program was conceived because:

1. Accidents in the home far outnumber those in the mill—the ratio is eight to one
2. Worry and concern of employes over accidents affecting members of their families tend to lower their own efficiency and increase industrial mishaps
3. An employe, through the loss of time and income due to an accident in the home or on the highway, upsets the economic condition of his entire family

Safety Equipment

An "emergency cabinet" in the mill safety headquarters contains such equipment as a breathing appartus (Chemox) which can be worn safely for production or emergencies in atmospheres

(*Continued on next page*)

CESCO ***RIGHT... before your Eyes!***

New, Larger COVER GOGGLES

fit over ALL modern glasses...

New CESCO Cover Goggles fit well over all popular styles of glasses— even over extreme types such as these.
FEATURES
Lightweight, sturdy plastic with contoured edges. Weight is well-distributed for comfort and safety.
LENS VENTILATORS
Slots in edges of lens frames and rings are offset to baffle air flow.
HEADBANDS
Three types, all fully adjustable—Comfort King round rubber, flat rubber, or elastic.
SIDE SHIELDS
Baffled type for welders.
Perforated for chipping and grinding.

The *NEW* CESCO series 548 and 549 Cover Goggles are 20% larger than former cover goggles and will fit comfortably over all popular styles of men's or women's glasses. Newly designed, contoured edges eliminate pressure points on the nose and seal out flying particles or light flashes. Larger air space within goggles reduces fogging.

Screw-type retaining rings permit quick lens change from front. Standard 50mm lenses set flush with rings to deflect flying objects. Chippers style has indirect ventilation through slotted lens rings and direct ventilation through perforated side shields. Welders and dust models have indirect ventilation through side shields. Simplified bridge adjustment. Choice of 3 adjustable headbands: elastic, flat rubber or Comfort King round rubber.

For a really modern goggle, there is nothing better than the **No. 548** CESCO Cover Goggle. It is *"Right... before your eyes!"*

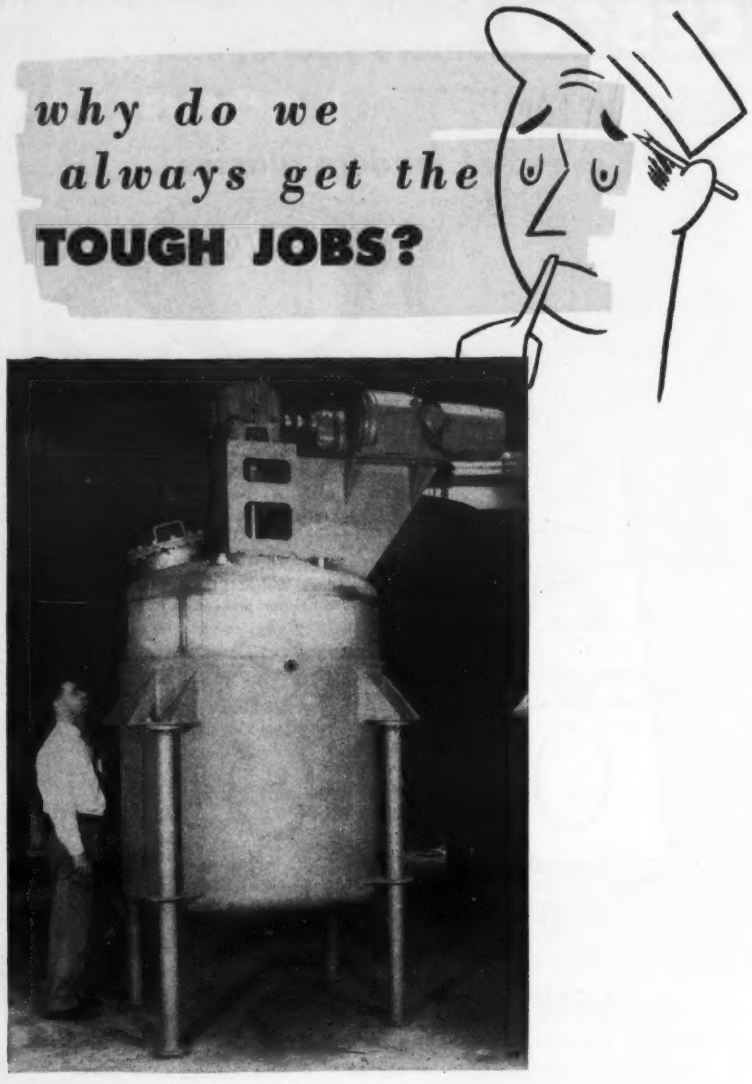
See or write your CESCO safety equipment distributor for full details

CHICAGO EYE SHIELD COMPANY • 2316 Warren Blvd. • Chicago 12, Ill.

CESCO FOR SAFETY

OFFICES IN: Atlanta, Birmingham, Boston, Buffalo, Cincinnati, Cleveland, Columbus, Detroit, East Orange, Houston, Kansas City, Knoxville, Little Rock, Los Angeles, Mexico City, D. F., Milwaukee, Montreal, Philadelphia, Pittsburgh, Salt Lake City, San Francisco, Spokane, St. Louis, St. Paul, Toledo, Tulsa

When inquiring check CP 1973 on handy form, pgs. 2-3



HONESTLY, some special jobs we get drive our engineering dept. crazy! The job we illustrate for example, started off as an idea in a customer's head . . . then a pencil sketch with a few dimensions, etc.—then they told us to carry the ball.

Well, we're proud that our customers have that supreme confidence in our ability to translate their ideas into realities. That's why we maintain one of the finest engineering staffs in the business. That's why our fabricating plant has the finest precision equipment necessary to delivering top quality work.

Incidentally the job is a 700 gal. chemical reaction kettle made of type 316 stainless steel. Made under ASME code, it has a working pressure of 25 lbs., a jacket pressure of 35 lbs. A special feature is a variable speed drive from 33 RPM to 254 RPM.

What is it used for . . . that's the customer's secret.

For comprehensive bulletin Write Dept. D

P.S. we'd like your TOUGH JOBS -- Too!

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DIVISIONS: F. C. DECKEBACH SONS CO., HAMILTON COPPER & BRASS WORKS, BUCYRUS KETTLE WORKS
est. 1914 • engineers • metalsmiths • machinists • designers, producers of chemical processing equipment

When inquiring check CP 1974 on handy form, pgs. 2-3

(*Continued from preceding page*)

contaminated by poisonous gases or deficient in oxygen.

Instruments which are capable of detecting concentrations of explosive gases or carbon dioxide are kept ready for use. A type of apparatus (Pneolator) to administer artificial respiration automatically (see accompanying photo) in cases of suffocation, gas poisoning, electric shock and other accidents, is included in the equipment.

Because of its geographic location in the valley, the mill continuously is exposed to the hazard of chlorine gas. Instead of hiding the hazard, Luke's safety department constantly reminds employes about the dangers of chlorine gas. However, the department also emphasizes the precautionary measure taken to combat it. Cabinet storage of small "pocket type" respirators for emergency use of employes in buildings near all sources of chlorine is one example.

Enthusiasm

Perhaps the best example of "safety enthusiasm" is the fact that it took a full week to hold the turkey dinner given annually by the mill manager for all employes of departments which have completed a full year without having a lost-time accident.

In one department, a worker sustained an injury that marred the record. It was the only lost-time accident for the year in the department, but it cost all employes of the department their turkey dinner. That worker personally sponsored a "compensation" turkey dinner at his home for employes of the department.

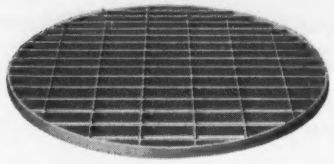
(Information was received and reported through the courtesy of Mine Safety Appliances Company, Department CP, Braddock, Thomas and Meade Streets, Pittsburgh 8, Pennsylvania.)

One-man fire engine has capacity of 150 lb . . .

expellent is dry N_2 at pressure of 200 psi

Uses: Against class B and C fires — carries inspection and approval label of Underwriters' Laboratories for those classifications.

REMOVE THE DANGER OF OPEN AREAS



Here's the Solution!

Blaw-Knox Electroforged Steel Grating is the ideal "coverage" for unprotected pits, light wells, basement stairways and other hazardous open areas. It is a one-piece steel "material" that provides safe footing under any conditions, and admits the maximum of light and air. *Strong . . . Silent . . . Secure.* Thousands of installations are still on the job after 20 years of traffic!

Send us dimensional sketch
We will then forward you price on grating cut to exact size. No nuts, no bolts, no special tools required. Don't delay . . . write today and make those danger spots both safe and usable!

BLAW-KNOX COMPANY
Grating Department
BLAW-KNOX EQUIPMENT DIVISION
2076 Farmers Bank Bldg.
Pittsburgh 22, Pa.

ELECTROFORGED® STEEL
BLAW-KNOX GRATING

When inquiring check CP 1975 on handy form, pgs. 2-3

Kleenslot
WEDGE-WIRE PREPARATION SCREENS
FOR DEWATERING, SIZING AND SCREENING OPERATIONS

The chemical, food and general industries can't afford to overlook this product. Accurate openings, great strength, long life and economy makes WEDGE-WIRE Preparation and Vibrator Screens and Screen-Guards "front line" products.

Cross section at left shows how KLEENSLOT Screens operate on a non-clogging principle.

SEND THIS COUPON TODAY!
DON'T DELAY

WEDGE WIRE CORP.
5610 Clark Ave., Cleveland 2, Ohio
Gentlemen:
Please send us literature outlining the superiority of Wedge Wire construction.
COMPANY_____
NAME_____
ADDRESS_____

Wedge-Wire CORPORATION
5610 CLARK AVE. CLEVELAND 2, OHIO

When inquiring check CP 1976 on handy form, pgs. 2-3

ATTENTION:

Plant Safety Engineers

Here's How *YOU* can Prevent Production Losses Caused by Dermatitis

. . . Reduce Medical Costs and Improve Industrial Relations

Dermatitis actually wastes *more* man hours and medical treatment dollars than the more sensational industrial "accidents".* Furthermore, dermatitis cases cause revulsion, not only among afflicted employees, but their co-workers as well.

You can prevent these distasteful situations by providing the *proper* protective garments and *insisting* that personnel in your plant always wear them when in contact with irritating substances.

Gloves are especially important in reducing dermatitis cases and your production managers will thank you for choosing the *right* gloves for each job. Comfortable fit, hand freedom and long wear pay off in employee good will, increased production and lowered operating costs.

PIONEER liquid-tight Stanzoil® gloves, made of oil and acid resistant non-allergic DuPont milled neoprene, are reducing hand dermatitis hazards in hundreds of plants all over the world. 32 safety styles, weights, size and colors . . . PIONEER catalog shows you *at a glance* how to choose the most efficient and economical glove for the job.

Don't risk costly time out — write for complete information today.

**Occupational Hazards, December, 1952*

Industrial Products Division

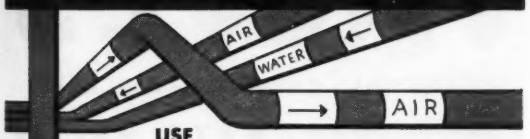
The PIONEER Rubber Co. 241 Tiffin Road Willard, Ohio

Quality Gloves for 35 Years

When inquiring check CP 1977 on handy form, pgs. 2-3

FOR FAST, ECONOMICAL

PIPE IDENTIFICATION



USE

TEL-A-PIPE MARKERS

Tell at a glance { PIPE CONTENTS / DIRECTION OF FLOW

Economical—800 stock descriptions to choose from. TEL-A-PIPE Markers conform to A.S.A. Standards, come in 4 standard sizes to fit smallest tubing or largest pipe. TEL-A-PIPES can also be made to your specifications—any size, description or color.

Easy and quick to apply—TEL-A-PIPE Markers eliminate costly man hours spent painting or stenciling. They are *pressure-sensitive*—require only finger-tip pressure. TEL-A-PIPES are permanent sticking and will not curl, chip or peel—use indoors or out. Special adhesive coating on durable fabric resists dirt, oil, moisture, etc.

Write today for free samples and specifications.

WESTLINE PRODUCTS DIVISION

WESTERN LITHOGRAPH CO. DEPT-CP-6

600 East Second Street, Los Angeles 54, California

When inquiring check CP 1978 on handy form, pgs. 2-3

Features: Stated that it can be easily wheeled, maneuvered and operated by one man.

Description: With a discharge capacity of 150 lb, Model 150 is a wheeled unit discharging manufacturer's Alfco Dry Chemical. Its total weight when fully charged is 480 lb. Discharge range is 20 to 25 feet.

Expellent is dry nitrogen with a sustained operating pressure of 200 psi during entire period of discharge. All the contents can be

Has sustained operating pressure of 200 psi during discharge

discharged in about 45 sec, if necessary. Nozzle lever has a spring loaded mechanism which permits opening or closing the nozzle at operator's option.

(Introduced by American-LaFrance-Foamite Corp., Dept. CP, Elmira, N. Y. . . . or for more information check CP 1979 on handy form, pages 2 and 3.)

How to make fibers fire retardant

Revised technical bulletin describes methods of applying firm's product line to impart fire retardancy. Discussion includes application to cotton, rayon, wool, mohair or combinations of these fibers. "Pyroset DO Fire Retardant" is issued by American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. When inquiring specify CP 1980 on handy form, pages 2 and 3.

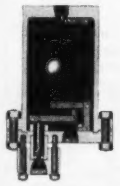
there's a RIGHT way to trap a Steam Line!

JUST SPECIFY Clark CONTROLS

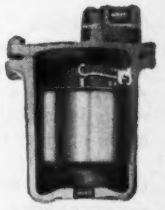
Thanks to the proven dependability and completeness of the Clark steam trap and regulator lines, power engineers can meet most of their requirements simply by calling a Clark representative. For there's a "right" Clark steam trap for every purpose.

Clark makes the famous patented Duo-Step inverted bucket traps that handle *double* the usual amount of condensate. In addition, Clark manufactures open bucket and float type traps as well as pressure regulators and strainers.

So call on Clark for *all* fluid control requirements. There are Clark representatives in most major cities.

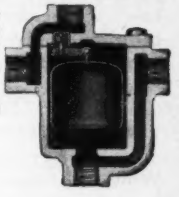


SERIES "450" FLOAT TRAP. For drainage where continuous flow is desired, or for maintaining liquid levels. Steel construction for pressures to 600 P.S.I. Compound linkage gives larger capacity. Size ½" to 2".



SERIES "80"-D (DUO-STEP) TRAPS. Cast semi-steel construction for pressures up to 250 P.S.I. and temperatures to 450°F. Equipped with Duo-Step Leverage and Venting, Clark-loy seats and discs. Pipe sizes from ½" to 2".

"Y" SELF-CLEANING STRAINERS. Remove dirt, scale and grit from steam, fluid and gas lines. Sizes ½" to 3" I.P.S.



SERIES "60" INVERTED BUCKET TRAP. Choice of horizontal or vertical inlet or outlet. For pressures up to 150 P.S.I. "Clark-loy" guided disc and seat.

THE HOME OF DUO-STEP LEVERAGE

Clark

MANUFACTURING COMPANY

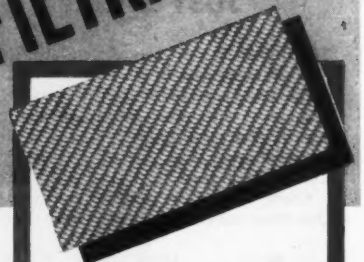
1830 EAST 38th STREET

CLEVELAND 14, OHIO

Distributors and Representatives in all major cities

When inquiring check CP 1981 on handy form, pgs. 2-3

Tops for broad-range CHEMICAL FILTRATION



NFM VINCEL** and VINYON N† are excellent general purpose filter cloths. They are available in a variety of weaves and in any desired standard width from 26" through 72" or as made up filter element covers.

Over Forty Years of weaving experience have given us the "know how" so necessary to the production of top quality Industrial Filtering Fabrics. We weave all these Synthetic Fiber fabrics: Glass, Nylon, ORLON* (acrylic fiber), Saran, VINCEL** and VINYON N†.

Write us about your requirements, we'll be glad to send test cloths, if you are not sure which cloth material is best.

"Excellent Resistance—No Attack" are the operating reports when these filter cloths are used for filtering:

ACIDS

SULPHURIC
HYDROCHLORIC
NITRIC
HYDROFLUORIC
AQUA REGIA

CAUSTICS

SODIUM HYDROXIDE
POTASSIUM HYDROXIDE

and

CHLORINE or BROMINE WATER
SILVER NITRATE
TANNIC ACID
MANY OILS, FATS and WAXES

*T.M.—E. I. duPont de Nemours Co.
**T.M.—Reg. U.S. Pat. Off.
†T.M.—Union Carbide & Chemical Co.

Weavers of Industrial Filter Media for over Forty Years

The National Filter Media Corp.

General Offices & Mills: New Haven 14, Conn.
Western Office & Factory: Salt Lake City 1, Utah

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Chicago, Ill.	Cincinnati, Ohio	Houston, Texas	Oslo, Norway	Johannesburg, South Africa
2627 West 19th St.	Roselawn Center Bldg.	1406 Second National Bank Bldg.	Nicolai Friis	Edward L. Bateman

When inquiring check CP 1982 on handy form, pgs. 2-3

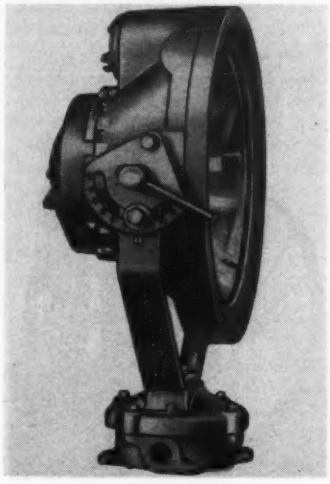
Add 500 w floodlight for hazardous locations . . .

has heavy, tempered and impact-resisting lens

Uses: Floodlight for use in hazardous locations or atmospheres.

Features: Has a heavy, tempered and impact-resisting lens.

Description: RLEE-14 is a 500 w floodlight which has an aluminum reflector and degree-marked aiming quadrants. A separate explosion-proof wiring compartment in its base is isolated from the lamp compartment by an explosion-proof seal.



Degree-marked aiming quadrants are featured in this explosion-proof floodlight

(Available from Crouse-Hinds Co., Dept. CP, 1347 Wolf St., Syracuse 1, N. Y. . . . or for more information check CP 1983 on handy form, pages 2 and 3.)

Improved finish offers better wet grip . . .

extends from middle of palm to ends of fingers on glove

Uses: Work gloves.

Features: Extending from the middle of the palm to the ends of the fingers, an improved finish offers better wet grip, longer wear, and resistance to chipping, cracking or peeling.

Description: Finish on Redmont coated fabric work gloves is made

FREE CATALOG!

available to you who are interested in the facts on open steel flooring.

Up to the minute information on the hows and whys of construction and installation of Tri-Lok Open Steel Flooring may now be at your finger-tips. Here is a four-page catalog designed to aid you in selecting the best types and styles of open-steel flooring for your particular construction project.

IN THIS CATALOG YOU'LL FIND

- Tables of Safe Loads
- Specifications required for open steel flooring installation
- Types of Tri-Lok Open Steel Flooring available
- Information concerning construction, sizes, strength and adaptability of Tri-Lok Open Steel Flooring

FOR YOUR COPY, WRITE FOR BULLETIN PW 1102-24

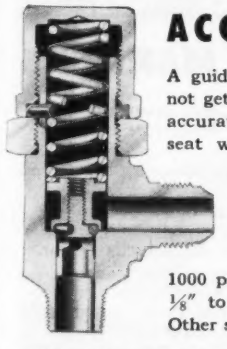
DRAVO
CORPORATION
National Distributor for THE TRI-LOK CO.
Dravo Building, Fifth and Liberty Avenues, Pittsburgh 22, Pa.

When inquiring check CP 1984 on handy form, pgs. 2-3

REPUBLIC

VALVES

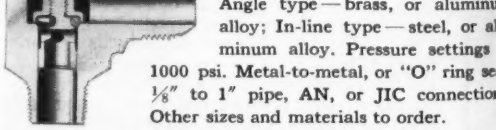
INDUSTRIAL • CHEMICAL • AIRCRAFT



ACCURATE RELIEF

A guided piston that cannot get out of line assures accurate relief, and long seat wear. High quality springs make settings permanent. Angle type — brass, or aluminum alloy; In-line type — steel, or aluminum alloy. Pressure settings to 1000 psi. Metal-to-metal, or "O" ring seal. ⅛" to 1" pipe, AN, or JIC connections. Other sizes and materials to order.

Write for complete catalog and nearest distributor.



RM REPUBLIC MANUFACTURING CO.
1930 WEST 77TH STREET • CLEVELAND 2, OHIO

When inquiring check CP 1985 on handy form, pgs. 2-3

ALCONOX®....

The NUMBER ONE Name in LABORATORY DETERGENTS

The tested, proven, accepted fast-acting detergent and wetting agent.

For less than 2½ cents a gallon, all laboratory glassware, metalware, porcelain, silverware, etc., can now be kept sparkling clean and film-free with a minimum of effort.

In addition, Alconox works with equal effectiveness in either hard or soft water, hot or cold—and is absolutely harmless to human tissue . . .

Try it—Buy it—and You'll Buy it again.

Available in

Box of 3 lb.	— price	$1.95
Carton (12 x 3 lb.)	— ea.	18.00
Bag of 50 lb.	— lb.	.40
Drum of 100 lb.	— lb.	.40
Barrel of 300 lb.	— lb.	.37

If your dealer cannot supply you, write for literature and samples.

Dept. CP-6

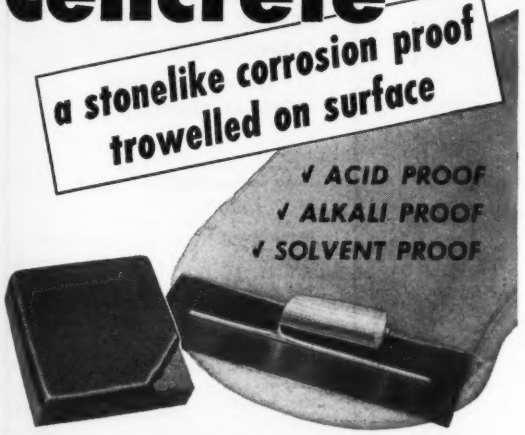
ALCONOX WETTING AGENT | ALCONOX, INC. | ALCONOX DETERGENT

When inquiring check CP 1986 on handy form, pgs. 2-3

Ceilcrete

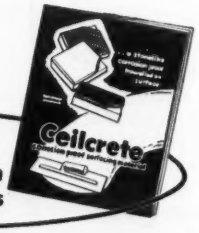
a stonelike corrosion proof trowelled on surface

✓ ACID PROOF
✓ ALKALI PROOF
✓ SOLVENT PROOF



TOPPING for FLOORS • WALLS ACID HOLDING TANKS • WASTE DISPOSAL SYSTEMS, ETC.

THE CEILCOTE COMPANY
4832 Ridge Road, Cleveland 9, Ohio



Send for technical data on its application, corrosion resistance properties

When inquiring specify CP 1987 on handy form, pgs. 2-3

of a material which cures into and becomes a part of the base coating. Gloves are available in five styles ranging from a fully coated knit-wrist to a gauntlet which extends to elbow length.

(Products of Edmont Manufacturing Co., Dept. CP, 1204 Walnut St., Coshocton, Ohio . . . or for more information check CP 1988 on convenient Reader Service slip between pages two and three.)

Eliminates need for liquids, tissues in lens cleaning . . .

cloth is packed in handy individual plastic bags

Uses: On glass or plastic surfaces such as eye-glasses, windshields, windows, mirrors, etc., to prevent the formation of fog or steam caused by body heat, humidity or temperature changes.

Features: Packed in handy individual plastic bags, cloth can be carried in the pocket.

Description: Wiping of surface to be treated with impregnated No-Mist cloth is stated to both clean and fog-proof in one operation. It eliminates the need of liquids, tissues or cabinets.

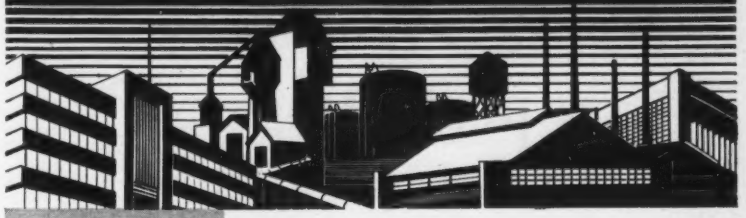
(No-Mist is available from Carol Chemical Products Corp., Dept. CP, 368 East 45th St., Brooklyn 3, N. Y. . . . or for more information check CP 1989 on convenient Reader Service slip between pages two and three.)

Vault doors that offer fire protection

Topics of discussion in 8-page bulletin are vault doors offering the following time limits of fire protection: ½, 1, 2, 4 and 6 hours. They are certified, according to the bulletin, to resist temperatures up to: ½-hour—1400°F, 1-hour—1550°F, 2-hour—1700°F, 4-hour—1850°F, and 6-hour—1925°F.

Specifications and illustrations of the vault doors are included. #SC-728 is issued by Remington Rand Inc., Dept. CP, 315 Fourth Ave., New York 10, N. Y. When inquiring specify CP 1990 on handy form, pages 2 and 3.

we put the "Automatic" in FIRE PROTECTION



"Automatic" Fire Alarm Systems
For all types of business
"Automatic" Sprinkler Systems
For industrial, commercial and institutional properties
"Automatic" CO_2 Systems
On-the-spot protection for many industrial fire hazards
"Automatic" Air Foam
For petroleum and chemical processing properties
"Automatic" FIRE-FOG
Protects high voltage electrical equipment
"Automatic" Dry Chemical Systems
For many Special Hazards

You've no doubt read or heard from time to time that one or another type of fire protection is the correct answer to your safety problem. One says foam is best. Another says water sprinklers are the answer. Perhaps carbon dioxide, dry chemical, or other media will do the trick.

What is the most effective method?

Without a thorough understanding of all conditions involved, we wouldn't hazard a guess. For fire protection, like any other scientific problem, requires (1) technical know-how, and (2) application of that knowledge. Most methods of fire safety are good . . . but only through "FIRE PROTECTION ENGINEERING"—designing, manufacturing and installing the specific type of system *best by test*—can you be sure of maximum safety.

So, we take all methods of fire alarm and control, combine them with extinguishing mediums—FIRE-FOG, Air Foam, Sprinklers, etc.—and compound the results by adding "Automatic" technical know-how as well as test and field experience. The result . . . the finest "Automatic" FIRE PROTECTION available at any price.

The subject is more vividly covered in our colorfully illustrated literature, "The ABC of Fire Protection." Write for free copy today.

"Automatic" Sprinkler

CORPORATION OF AMERICA • YOUNGSTOWN, OHIO

OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

When inquiring check CP 1991 on handy form, pgs. 2-3

"It's a QUICK, SAFE repair job with Scott Air-Paks (TRADE MARK) protecting us!"

MODEL 6000 - A2M

MODEL 6000 - B4A

★ Repair and maintenance jobs that must be performed in atmospheres where breathing is hazardous or difficult are completed quickly and efficiently by workers wearing SCOTT AIR-PAKS. Workers are assured of getting as much *cool, fresh air* as they want, no matter how hard they work. Simple to operate and fast, you'll find Scott Air-Paks protecting health and lives throughout the nation's industries . . . they have the *lowest operating cost of any breathing equipment.*

ESTABLISHED IN 1932 Scott FOR SAFETY—FOR SERVICE

WRITE FOR BULLETIN NO. 510 showing models for every job or call in your Safety Equipment Dealer — today.

SAFETY EQUIPMENT DIVISION

SCOTT AVIATION CORP.

242 ERIE ST., LANCASTER, N. Y.

CANADA: SAFETY SUPPLY CO., TORONTO — BRANCHES IN ALL PRINCIPAL CITIES

EXPORT: SOUTHERN OXYGEN CO., 157 Chambers Street, New York 7, N. Y.

When inquiring check CP 1992 on handy form, pgs. 2-3

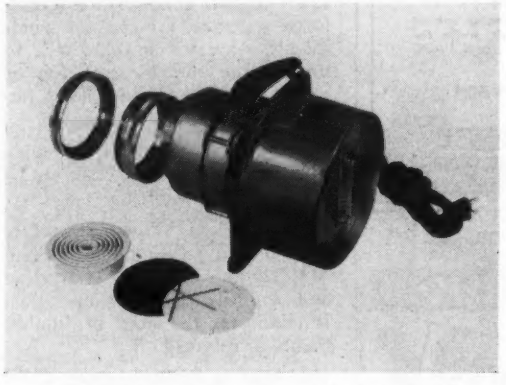
AEC-developed air sampler has interchangeable filter paper system . . .

aluminum fan housing assembly provides minimum weight necessary for portability

Uses: Air sampler for industrial enterprises concerned with freedom from air pollution. It is used in the paper and photographic industries where product purity, especially for radioactive airborne contamination, is of extreme importance. In the fields of atomic energy, it is used for detecting radioactive particulate from remote atomic proving ground detonations, and from any atomic pile or laboratory mishap or catastrophe.

Features: Portability and interchangeable filter paper system.

Description: "High Volume Air Sampler" consists of a pump and motor designed for 24-hour sampling providing a minimum air flow of 30 cubic feet per minute; a fan housing assembly of aluminum, a rate of flow indicator and a number of types of filter paper depending on the rate of flow to be used.



Interchangeable filter paper system features AEC developed air sampler

Instrument was developed by U.S. Atomic Energy Commission and has now been released for general use by industry.

(Available from The Atomic Center for Instruments & Equipment, Inc., Dept. CP, 489 Fifth Ave., New York 17, N. Y. . . . or for more information check CP 1993 on handy form between pages two and three.)

Pictures and specifications of fire protection equipment

Many types of fire extinguishers are pictured and described in 6-page bulletin, along with recharges, fire hose and cabinets, and gasoline safety containers. Specifications are conveniently tabulated. "General Quick-Aid Fire Guards" is issued by the General Detroit Corp.-The General Pacific Corp., Dept. CP, 1501 E. Washington Blvd., Los Angeles 21, Calif. When inquiring specify CP 1994 on handy form, pages 2 and 3.

Have you changed your address recently?

● If so, you'll want to insure that your copy of CHEMICAL PROCESSING reaches you without interruption. Just send us your new address . . . use the handy form below.

Please answer all questions in regard to your new affiliation, and in addition give us your former address including company, city and state.

mail this request to
READER SERVICE DEPT.
CHEMICAL PROCESSING
111 East Delaware Place
Chicago 11, Illinois

Former Company Affiliation .....

Former Address .....

Your Name ..... Present Title .....

Present Company .....

Main Product .....

Rating of Company .....

Street Address .....

City ..... Zone No. ..... State .....

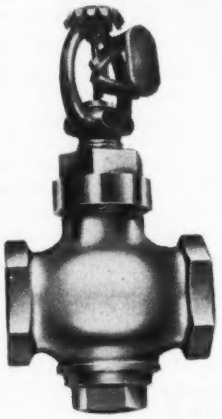
Shut-off valve works like standard sprinkler . . .

will operate in any position — even upside down

Uses: Automatic safety valve designed particularly for checking fuel-fed fires.

Features: Explosion proof — in case debris or blast knocks off the head, valve immediately closes to prevent fire or secondary explosions. It will operate in any position, even upside down.

Description: Automatic Shut-off Safety Valve is a quick-closing type that is normally held in an open position by an Underwriter's and Factory Mutual Approved actuating head that operates like a standard sprinkler head. At the specified temperature, the head opens and releases tension on a heavy, stainless steel spring which closes the valve in a fraction of a second.



In case blast knocks off head, valve closes immediately

Valve is installed just like any other valve — no special tools or techniques are required. It is reportedly in use on both gas and liquid lines carrying fuels and process materials.

(Available from Valco, Inc., Dept. CP, 1410 West St., Cincinnati 15, Ohio . . . or for more information check CP 1995 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 1996 . . . see information request blank between pages 2 - 3.

It's *easy* to produce and maintain *high vacuum* in big systems

We do it every day—design and manufacture vacuum furnaces, dehydration systems, vacuum stills, pumping systems for particle accelerators, and other large high vacuum units.

The high vacuum metallurgical furnace illustrated above is typical of the large units *CVC* is designing and manufacturing.

CVC's ever expanding line of standard high vacuum pumps, valves, gauges, and accessories offers unlimited possibilities for assembling efficient, high capacity gas handling systems. Our highly skilled designing and manufacturing facilities stand ready to engineer and build completely integrated high vacuum systems.

So, if a large high vacuum system can help you improve a product or process it will pay you to talk to us—***Consolidated Vacuum Corporation, Rochester 3, N. Y.*** (A subsidiary of Consolidated Engineering Corporation, Pasadena, Calif.)

CVC

formerly DPi Vacuum Equipment Dept.

Consolidated Vacuum Corporation

Rochester 3, N. Y.

designers and manufacturers of high vacuum equipment

SALES OFFICES: MENLO PARK, CALIF. • CHICAGO, ILL. • CAMDEN, N. J. • NEW YORK, N. Y.

Performance records prove.....

A pottery* in Ohio tried practically every type of valve on its "slip" lines, but the highly abrasive material, at 125 pounds pressure, ruined the average valve in a few months—in some cases, in a few weeks. Our engineers recommended HOMESTEAD Cam-Seald VALVES with special, hard-faced plugs and bodies. The pottery installed them on all "slip" lines in the plant.

Performance records kept during the past several years show that the HOMESTEADS are lasting more than three times longer than any other valve previously used. Savings in replacement and maintenance costs repay many times over the first cost of the HOMESTEADS.

For more than 60 years HOMESTEAD VALVES have been licking equally tough jobs on scores of services in many different types of industries. Chances are there's a valve problem they can solve for you. Why not ask our engineers about it? No obligation.

*Name on request.

Write today for VALVE REFERENCE BOOK No. 39.
Consult Yellow Pages of Phone Book for Local Representative.

HOMESTEAD
VALVE MANUFACTURING CO.
Serving Since 1892
P.O. BOX 140 CORAOPOLIS, PA.

When inquiring check CP 1997 on handy form, pgs. 2-3

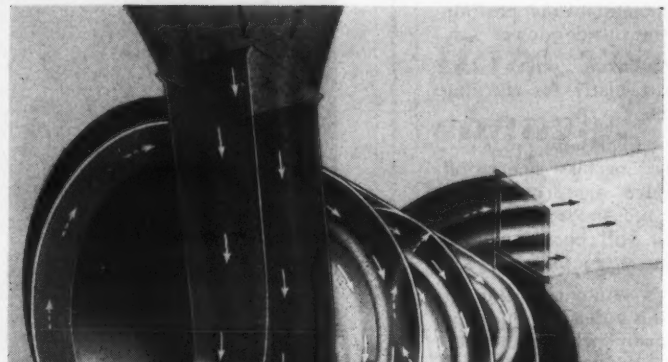


Fig 1—Drawing illustrates how unit efficiently separates dust from air

Plants Report 97 to 99% Efficiency for Simplified Dust Collector

Centrifugal unit, having low pressure drop of 2 to 4" of water and minimum maintenance and cooling, is available in stainless steel, aluminum, or Neoprene-lined for special applications

USES: A number of the units are being used for collecting titanium oxide pigment, the average particle size varying from 0.2 to 0.7 microns and averaging 0.3 microns. Another application is for collection of fine coal dust and smoke from a coal dryer. In this operation, 80.5% of the dust is less than 44 microns in size.

Equipment is also being used at present for separation of copperas and ganister from air. In addition, units are being utilized by a large copper company, by an asphalt company, and in a sand drying operation. Application is widespread for grinding, buffing, polishing, and similar mechanical operations.

According to manufacturer, other representative applications include use over alkali tanks, chromic acid tanks, and a variety of chemical and pharmaceutical processes. Other typical materials collected are aluminum dust and fumes, cyanide fumes, oils and oil fumes, phosphate rock dust, styrene, and soda ash.

Fig 2—Shows end view of three collectors on the roof of a Detroit plant

Features: Collecting efficiency by weight measurement is 99% on one application in which coal dust and smoke are collected. Company collecting copperas reports an efficiency of 97%. With these high efficiencies, the pressure drop through the unit is only 2 to 4" water gage. Efficiency can be increased to almost any figure desired by changing method of operation or size of unit. However, pressure drop through unit may also become greater with higher efficiency.

Simplified centrifugal design of unit dispenses with the usual water curtains and sprays, water eliminators, pumps, and rotary elements. This permits minimum maintenance requirements and reduces cooling and humidification of the air. Although standard construction is steel, units can be furnished in stainless steel, aluminum, or Neoprene-lined for special corrosive applications.

Description: Method of operation of wet dust collector is illustrated in Fig 1. Dust is separated from the air by centrifugal action while water wets and entraps the dust. Unit is essentially a stationary screw within a horizontal, pear-shaped barrel. Fig 2, showing three large collectors on the roof of a factory in Detroit, gives a good view of the exterior appearance when in operation.

Dust-laden air enters at one end of the barrel under the suction of an exhaust fan connected to the outlet at the opposite end. During its flow within the barrel, the dust is continuously centri-

(*Continued on next page*)

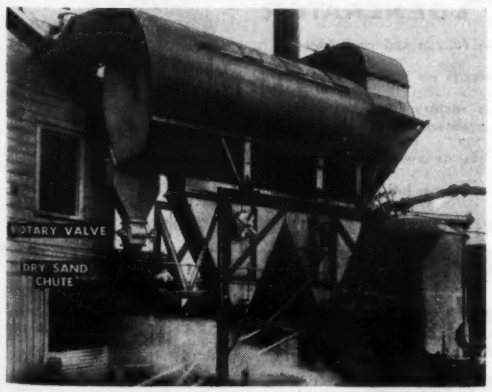
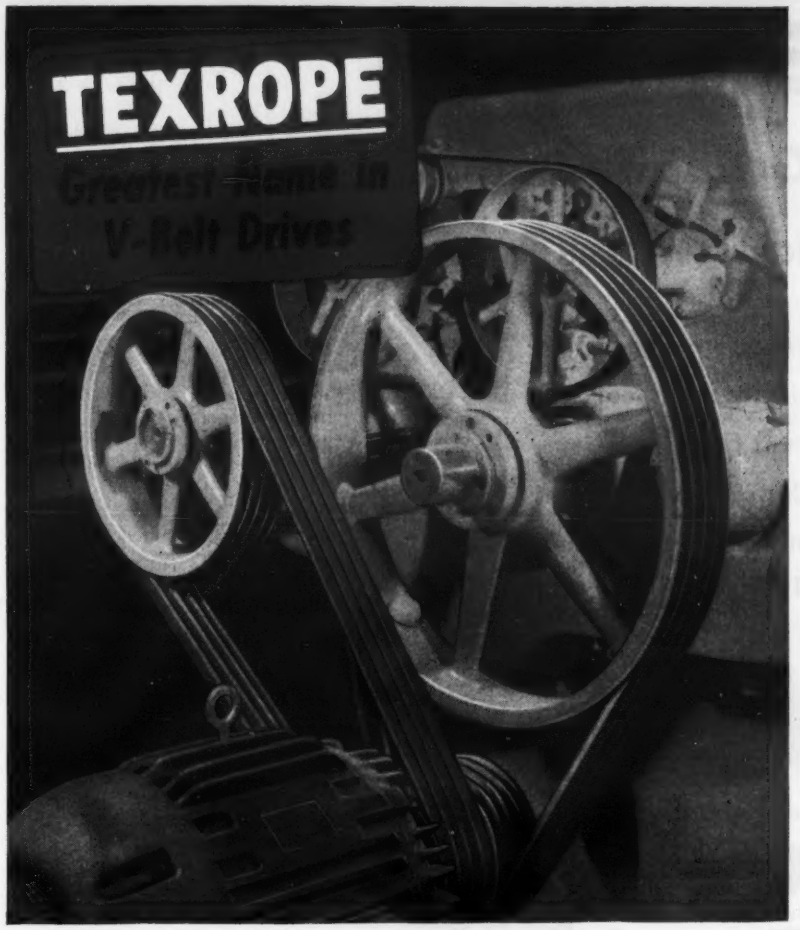


Fig 3—Plant installation of a slightly different type of the collector in which the first helical portion is dry



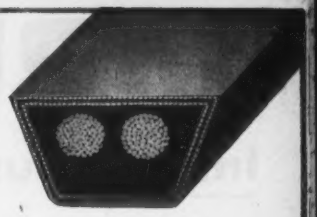
Everything in V-Belt Drives

from one reliable source!

ALLIS-CHALMERS HAS BOTH the engineering experience and the drive equipment to lick the most unusual problems. Your special problems are carefully analyzed by a staff of experienced application engineers familiar with your industry. The result — the right drive for the job! Call your nearby Allis-Chalmers distributor or district office for help on your drive problems, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4086

Texrope and *Magic-Grip* are Allis-Chalmers trademarks.

ALLIS-CHALMERS



TEXROPE **Grommet V-Belts—20 to 50% longer life than ordinary belts. Size for size, grommet belts give 1/3 more gripping power, pull heavier loads with higher safety factor.**

STANDARD CAST IRON SHEAVES — Made to order from stock patterns. One to 14 grooves for A, B, C, D or E belts. One to 1000 horsepower. Split sheave or split hub.

MAGIC-GRIP **SHEAVES — Semi-steel casting with interchangeable, patented taper bushings. On and off in a jiffy. Cannot shake loose. Two to 12 grooves for B, C and D belts; 2 to 250 hp.**

Sold . . .

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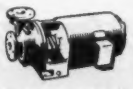
MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.



PUMPS — Integral motor and coupled types from ¾ in. to 72 in. discharge and up.

When inquiring check CP 1998 on handy form, pgs. 2-3

IMPERVITE

Impervious Graphite Pumps

Speed Chemical Processing Because:

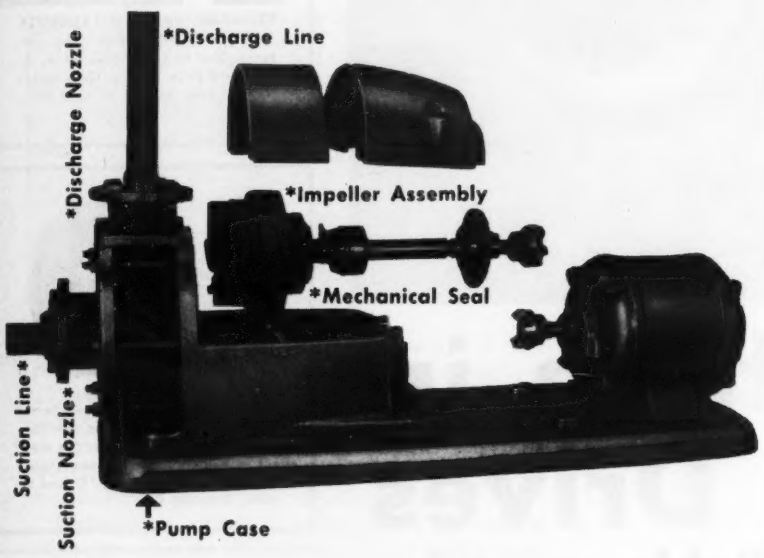
THEY Resist the sharpest corrosives

Maintain chemically tight seal

Provide maximum clean flow

Last longer under severe conditions

Provide solid Impervious Graphite parts (not a thin facing) at all contacting surfaces *



AND! Disassemble for inspection or repair without disturbing the processing lines.

ASK FOR NEW DESCRIPTIVE BULLETIN

Falls Industries, Inc.
AURORA ROAD - SOLON, OHIO

When inquiring check CP 1999 on handy form, pgs. 2-3

CONSTRUCTION

(Continued from preceding page)

fuged through four revolutions along a helical path formed by the screw. Lower portion of the horizontal barrel contains water, the surface of which is swept by the air stream. Angular impingement and the friction of the air against the surface of the water induce a sheet of water to flow around the periphery of the barrel.

Elimination of barriers and fact that at no point is air required to abruptly change its course accounts for the economical, high efficiency performance of the unit. The reduction in cooling and humidification results from the continuous sheet of water against the inner surface of the shell, never crossing or intermixing with the air stream.

Three different methods for removal of the sludge are available. When dust-creating process is not continuous, manual removal of sludge should be considered from an economic standpoint. Once outlet cover is removed, sludge will flow out by gravity. Second possible procedure is hydraulic removal, which requires either a constant supply of fresh water or a pump to recirculate the water. Third method uses a scraper conveyor.

One device by which the efficiency of the unit can be improved still further is to reduce the depth of the screw thread. This increases air velocity, with resultant higher dust collection efficiency. However, it also results in greater pressure drop and added power requirements. In othes cases, when dust concentration is excessive for good efficiency, an over-size unit can be used for higher efficiency.

Dust collector is available in capacities ranging from 2000 up to 30,000 cfm. Size depends upon specific model and capacity. Dimensions of 12,000 cfm unit are about 15′ for length, 4′ for shell diameter, and 12′ for height.

Fig 3 illustrates an installation of a slightly different type in which the first revolution of the collector is dry for separation of the coarser portion of the dust. Finer particles are collected in the section following this pre-cleaner. In the installation shown in Fig 3, the unit exhausts directly from a sand dryer. Dry sand collected by the precleaner is discharged through a rotary valve and used in making asphalt. Sludge in wet section is continuously removed hydraulically.

ACE-HIDE

For handling corrosive solutions. Tough, resilient, practically indestructible. Made of a new synthetic rubber-base material called ACE-HIDE, unaffected by most acids and alkalies. Drip-proof spout pours easily directed stream. Graduated scale inside pail. ORDER NOW from your rubber goods distributor, or write us.

ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY
93 Worth St., New York 13, N. Y.

When inquiring check CP 2000 on handy form, pgs. 2-3

1. SET IT ON YOUR CONCRETE FLOOR

2. MAKE SERVICE CONNECTIONS

3. TURN ON THE STEAM!

You Never Saw a UNIT So Easy to INSTALL and OPERATE!

AMESTEAM GENERATOR

- is fully piped and wired.
- needs no special foundation.
- is factory insulated and jacketed.
- has its own refractories.
- needs no heavy, costly stack.

20 SIZES
10 to 600 h.p.
15 to 200# OIL OR GAS

WRITE FOR FREE BULLETIN TODAY!

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Gentlemen:
Please send me further information on AMESTEAM GENERATORS and name of the nearest representative.
NAME.....
COMPANY.....
ADDRESS.....
.....

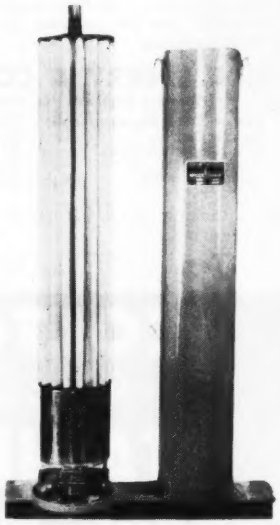
When inquiring check CP 2001 on handy form, pgs. 2-3

(Air Tumbler dust collector is product of Dust Suppression & Engineering Co., Dept. CP, 154 Grove St., Lake Orion, Mich. . . . or for more information check CP 2002, pages 2 and 3.)

Filtering area of 24 sq ft, furnished by condensing air filter . . .

when filter becomes dirty, entire cartridge can be quickly replaced

Air filter, which condenses water and oil before filtering, has a recently developed filter cartridge, constructed of wire mesh and flannel cloth, which provides more than 24 sq ft of filtering area, an increase of 37% over previous models. When the filter becomes dirty, the entire cartridge is quickly replaced after removing one nut at the top. Filter cartridge is said to eliminate costly shutdowns and effect a reduction in maintenance. Under normal working conditions, unit can be operated five to six months without the filter being renewed.



Unit offers economical removal of water and oil from compressed air

Condensing section has more than 950 sq in of surface area to cool the compressed air traveling through it. Dewpoint of the air is lowered to within two or three degrees Fahrenheit of the temperature of the cooling water used.

Water & oil, in entrained and vaporized states, are removed by condensation.

Units also incorporate snap-action trap. Accumulated condensate is discharged through the trap valve, which is designed to prevent leakage or pressure loss. Unit requires no attention during periods of operation, being completely automatic.

(Model A-100-D Condensifilter is product of Hankison Corp., Dept. CP, 141 Biltmore Bldg., 951 Banksville Rd., Pittsburgh, Pa. . . . or for more information check CP 2003, pages 2 and 3.)

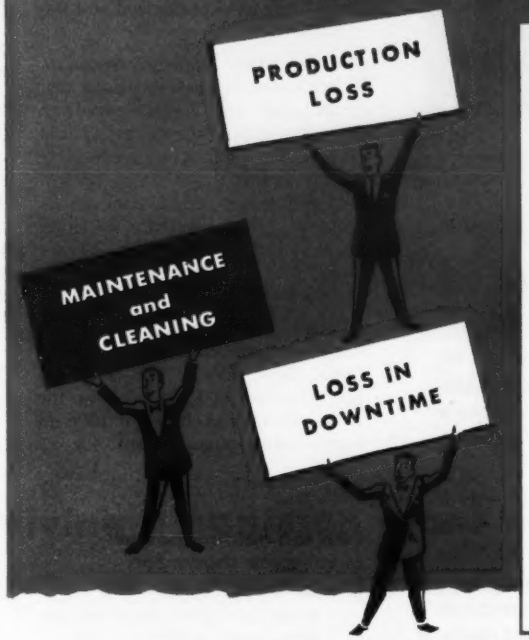
A company name and address . . .

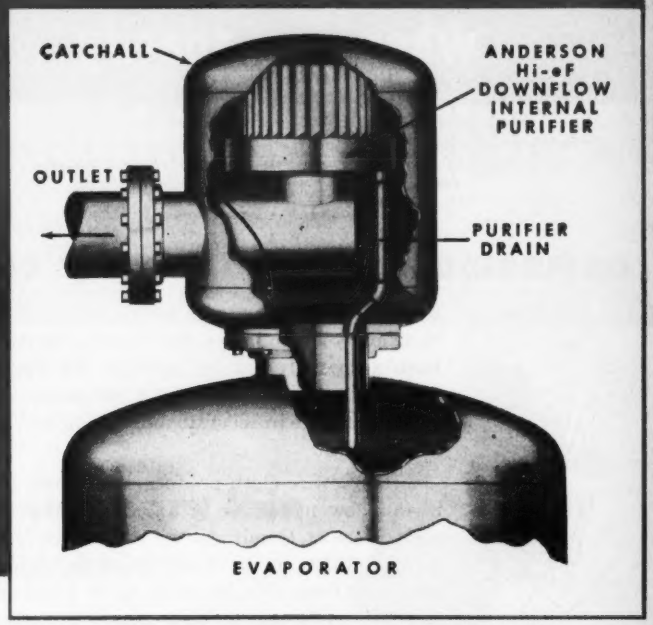
at the end of each editorial article makes it easy for you to follow-up on process improving ideas you read about in these columns . . . saves you time. Write direct or use the handy Reader Service slip.

THE EDITORS

STOP Entrainment losses in Evaporators Stills and Towers

with ANDERSON Hi-eF PURIFIERS





• Evaporators, stills, towers and similar vessels in your plant should have Hi-eF Purifiers. These money-saving units intercept and return to the evaporator all carryover thereby preventing possibility of loss of your valuable products. In addition, by removing this carryover and entrainment, a Hi-eF Purifier eliminates frequent cleaning of vapor lines, condenser tubes and other equipment. A Hi-eF Purifier pays you a rich profit by increasing the time intervals between cleaning and reducing downtime on these units.

Hi-eF Purifiers are the most economical protection you can buy . . . they cost no more than ordinary separators with lower efficiency . . . *yet are guaranteed 99% efficient in entrainment removal!* These carefully engineered purifiers pay for themselves over and over again . . . remove all carryover, solid particles, mist and moisture through carefully guided centrifugal action. Without moving parts or filters, Hi-eF Purifiers require no maintenance . . . have nothing to wear out or replace. Once installed they save you money day after day without any attention whatsoever. Let our engineering staff with many years experience recommend without obligation the proper solution to your current problem. Mail coupon for data.

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UPFLOW INTERNAL PURIFIER

LARGE LINE TYPE PURIFIER

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THE V. D. ANDERSON COMPANY
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Please send information on the following type of purifiers:

☐ Line Type ☐ Internal Upflow ☐ Internal Downflow ☐ Receiver

Name ..... Title .....

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City .....

State .....

BY THE MAKERS OF SUPER-SILVERTOP STEAM TRAPS

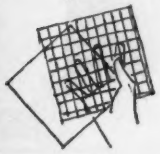
When inquiring check CP 2004 on handy form, pgs. 2-3

these LITTLE DIFFERENCES mean

BIG ADVANTAGES
when you specify

CAMBRIDGE INDUSTRIAL WIRE CLOTH

#1. Some manufacturers assign only one operator to as many as ten looms. But here at Cambridge, we have a specially trained operator for every single loom in the plant. Just a little difference . . . but a BIG advantage in accurate mesh count and constant screen width.



#2. Some wire cloth producers can work in only a certain few metals or in a limited range of mesh sizes. Here at Cambridge we can weave cloth from any metal that can be drawn into wire...our range of sizes runs from 20 x 250 mesh up to 4 inch openings ...a BIG advantage for customers with varied needs.

#3. Some manufacturers are not equipped to fabricate wire cloth into special forms, for example, filter leaves. But here at Cambridge, we can supply wire cloth in bulk or in practically any type of fabricated part . . . a BIG advantage that saves you time and money by providing one source for both weaving and fabrication.

These are just a few reasons why it will pay you to investigate Cambridge for your wire cloth needs. Call in your Cambridge Field Engineer to get the full story . . . and he'll gladly quote on your next order. Write direct or look under "Wire Cloth" in your classified telephone book.

FREE CATALOG! Gives full range of mesh sizes and types of cloth available from Cambridge, also valuable metallurgical data. Write for your copy today.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department F
Cambridge 6, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check CP 2005 on handy form, pgs. 2-3

CONSTRUCTION

Many forms possible with resin tubing

Extruded layflat tubing made from fluorochlorocarbon resins (Kel-F), can be thermally and electronically welded, vacuum formed, molded, and otherwise shaped to produce almost any container configuration, according to manufacturer. Material is available in a full range of widths and thicknesses from .002 to .010" in both plasticized and unplasticized types.

Tubing, called Trithene, is said to have been successfully used for drum and tank liners, expulsion bags for rocket propellants, pump and valve diaphragms, sterilizable plasma and pharmaceutical containers, and many other applications requiring freedom from moisture permeability and chemical attack along with high and low temperature resistance.

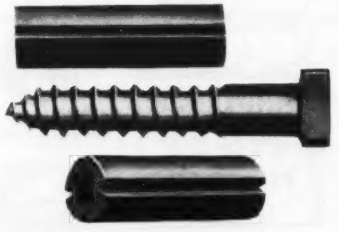
(Trithene is distributed for Visking Corp. of Terra Haute, Ind. by Flek Corp., Dept. CP, 2252 E. 37th St., Los Angeles 58, Calif. . . . or for more information check CP 2006 on handy form, pages 2 and 3.)

Two ton holding power in concrete shown for plastic anchors . . .

work is neater since smaller holes are needed

Uses: For use with 3/8, 7/16, and 1/2" lag screws or corresponding wood screws. Anchors can be used in any material that can be drilled. They have been approved for indoor or outdoor use by Underwriters' Laboratories.

Features: Testing laboratory pull-tests of anchors indicate a holding power of two tons in concrete. In addition, neater work results because smaller drilled holes are required. Anchors also eliminate



Plastic anchors are made of durable ethyl cellulose

for the exacting answers to your filtration problems . . .

SPERRY
FILTER PRESSES

When you consider the many advantages of Sperry Filter Presses, you can quickly understand why hundreds of manufacturers throughout the country depend on Sperry for solving industrial filtration problems of every kind.

Sperry Filter Presses offer greater economy — low first cost, minimum maintenance and long life . . . require less floor space . . . handle any kind of filterable mixture . . . and use practically any kind of filter material. For the complete story, ask for the big free Sperry catalog.

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COLTON
FINEST QUALITY
STAINLESS STEEL TANKS
ALL TYPES—STORAGE—PROCESS

AGITATORS
ALL TYPES—PORTABLE—BUILT-IN

Write for Literature

ARTHUR COLTON COMPANY
Established 1887
Div. Snyder Tool & Engineering Company
3400 E. LAFAYETTE • DETROIT 7, MICHIGAN

When inquiring check CP 2008 on handy form, pgs. 2-3

special setting tools and speed installation.

Description: These anchors are made of ethyl cellulose, a thermoplastic material noted for unusual dimensional stability. This plastic has the ability to withstand extremes in temperature, age, moisture, corrosion, shock, and vibration. It also possesses excellent dielectric properties.

Design of anchors consists of two separate sections, one to receive the screw, and the other to engage the wall of the drilled hole. As the screw is turned in, the anchor expands and the plastic material cold flows into every crevice of the drilled hole wall. A bonding and fusing action automatically takes place to provide a permanent trouble-free mounting.

(Sand-Scott plastic anchors are products of Holub Industries, Incorporated, Department CP, Sycamore, Ill. . . . or for more information reader may simply check CP 2009 on handy Reader Service slip between pages two and three.)

Color catalog presents welding electrodes

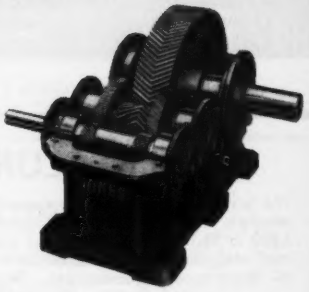
Twenty-page catalog in color lists company's complete line of stainless steel alloy arc welding electrodes. Explanation is included for two basic types offered: lime coating for all-position welding with DC reverse polarity; and AC/DC for welding of chrome-nickel steels with all types of AC or DC welding equipment.

Catalog also presents individual descriptions of 23 regular analyses and special analyses of electrodes, weld metal properties, welding procedures, electrode analysis and color charts, current ranges, and AISI type numbers.

Bul AR53-16 is issued by Alloy Rods Co., Dept. CP, York, Pa. When inquiring reader may simply specify CP 2010 on handy Reader Service slip between pages two and three.

For more information on product at right, specify CP 2011 . . . see information request blank between pages 2 - 3.

One of two new Allis-Chalmers kilns at Basic Refractories Inc. Maple Grove, Ohio plant. Dual drives engineered by Allis-Chalmers Mfg. Co. and W. A. Jones Foundry & Machine Co.



Driving a non-stop giant size rotary kiln calls for PLUS PERFORMANCE

That's why Basic Refractories selected JONES HERRINGBONE GEAR SPEED REDUCERS to drive two new rotary kilns — the largest in the world's refractory industry — at their Maple Grove, Ohio dolomite processing plant.

Operations at Basic are continuous. In processing, dead burned dolomite must be constantly *ON THE MOVE* — a drive failure could result in serious damage from the hot mixtures in the kiln.

Naturally, Basic Refractories' engineers took utmost care in the drive component selection for this important application. And, naturally, they chose JONES HERRINGBONE GEAR DRIVES because of their proven ability to stay on the job and take the 'round-the-clock, day-in and day-out punishment of continuous operation.

Giving PLUS PERFORMANCE under these and similar conditions is nothing new for any type Jones Speed Reducer — all are recognized and accepted throughout industry for all sorts of applications demanding rugged dependability, maximum capacity and quiet, smooth, power transmission.

BIG DRIVES — SMALL DRIVES — You may not have a giant kiln to drive; but when you have a power transmission job, big or small or anything in-between, your best answer is JONES . . . it has been for over 60 years.

W. A. JONES FOUNDRY & MACHINE CO. 4465 West Roosevelt Road, Chicago 24, Illinois

Ask for Catalog 70

Since 1890 . . . In the Service of Industry

Jones

. . . run d-c motors from a-c lines

with Variac Motor Speed Controls

- ★ 4 Models from 1/15 to 3/4 h-p DC Motors
- ★ Extra Fast Start-Stop-Reverse
- ★ No Electronic Tubes —no Warm-up Required
- ★ Speed Range 5-10 rpm to 15% Above Rated
- ★ No Jumpiness Even at Lowest Speeds
- ★ Good Regulation
- ★ High Starting Torque
- ★ Simple Installation —at Machine if Desired
- ★ Easy Maintenance
- ★ Low First Cost

Write for the VARIAC Speed Control Bulletin

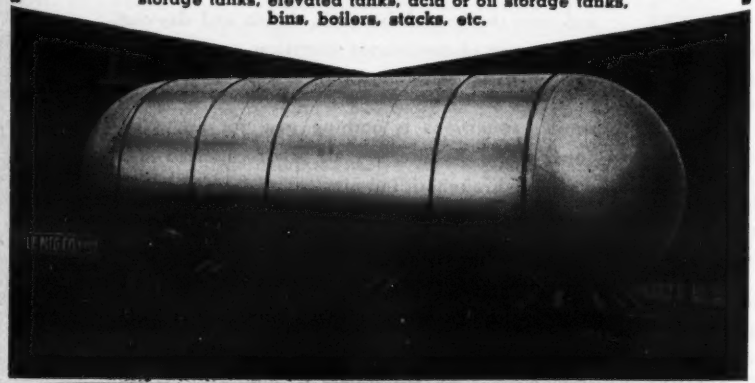
GENERAL RADIO COMPANY 275 Massachusetts Avenue Cambridge 39, Massachusetts

90 West Street NEW YORK 6 — 920 South Michigan Avenue CHICAGO 5 — 1000 North Seward Street LOS ANGELES 38

When inquiring check CP 2012 on handy form, pgs. 2-3

COLE ALUMINUM TANKS

We have available stock sizes from 9,500 to 22,800 gallons for pressure storage, and tanks of 99.6% pure aluminum for hydrogen peroxide from 5,000 to 11,150 gallons. "Cole" can furnish tanks made of steel, aluminum and stainless steel — built in accordance with ASME Code — to meet all insurance requirements. We invite your inquiries for high pressure storage tanks, elevated tanks, acid or oil storage tanks, bins, boilers, stacks, etc.



R. D. COLE MFG. CO.

NEWNAN, GA. Established 1854

TANKS TOWERS CYLINDERS VESSELS

When inquiring check CP 2013 on handy form, pgs. 2-3

CONSTRUCTION

Coal washer ups coke production by 16%

Coal washery installed by company at one of its coke plants has raised coke production by 16%, according to company's president. Capable of washing a large volume of raw coal a month, giant vibrating screens and filters of unit remove all rock and slate, leaving only the clean coal needed to make high-quality coke.

Washing system was installed over a six-month period without a single day's shutdown of operations. Washery processes up to 3400 tons of coal in an eight-hour shift, removing all waste materials with a loss of less than 1% of the coal.

Coal entering washery is classified according to coking characteristics, ash, and other qualities, and is placed in one of five mixing bins.

Then it is dropped through gates at bottom of each bin, mixed in proper proportions, and put into a washing jig. Here coal passes over a screen while an alternating flow of water washes away rock, slate, bone, and other refuse.

Washed coal is run over a de-watering screen, dried in centrifugal driers, and conveyed to storage bins for charging. Fine coal carried away by water is recovered in settling cones, dried on vibrating screens and other equipment, and finally is added to the coarser washed coal.

(Coal washer installed and used in coke plant of The Colorado Fuel and Iron Corporation, Department CP, Pueblo, Colo.)

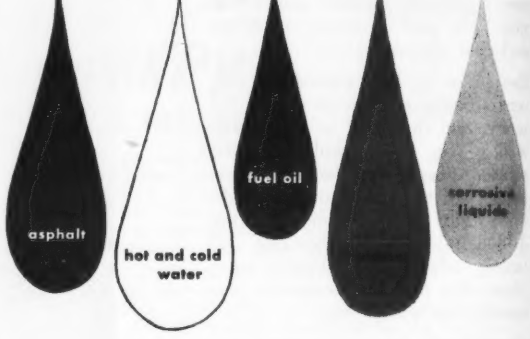
Stainless steel products presented in bulletin

Company's complete line of stainless steel plates, forgings, sheets (No. 1 finish), tank heads, and flanges are illustrated and described in manufacturer's 4-page bulletin.

Rings and disks are shown as typical of various forms pattern-cut to shape by company.

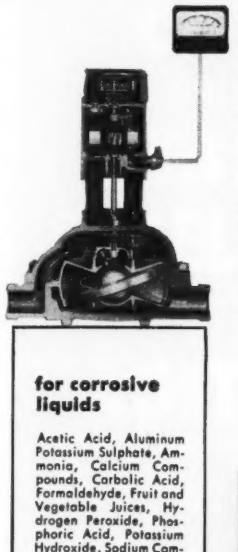
Bul Ref. C on stainless steel products is issued by G. O. Carlson, Inc., 510 Marshalton Rd., Dept. CP, Thorndale, Pa. When inquiring specify CP 2015 on convenient Reader Service slip between pages two and three.

viscosities unlimited



HAYS VERIFLOW METER AND HAYS ELECTRONIC VERITROL indicate and control liquid flow

Now virtually all fluids can be precisely measured and accurately controlled—*from a remote position.*



Hays VERIFLOW meter accurately measures, indicates, and totals the flow of corrosive and hard-to-meter liquids without using weigh tanks, orifice plates, or gage sticks.

With the Hays VERITROL you simply set a knob at the rate of flow desired . . . then, the VERITROL controls the flow of liquid at that set-rate.

Send for Pub. No. 53-766-38.

for corrosive liquids

Acetic Acid, Aluminum Potassium Sulphate, Ammonia, Calcium Compounds, Carbolic Acid, Formaldehyde, Fruit and Vegetable Juices, Hydrogen Peroxide, Phosphoric Acid, Potassium Hydroxide, Sodium Compounds, Sulphuric Acid (concentrated), Stearic Acid, and many others.

Automatic Combustion Control
Boiler Panels • Hays-Penn Flowmeters
Veriflow Meters and Veritrol
Gas Analyzers • Draft Gages
Combustion Test Sets • CO_2 Recorders
Electronic Oxygen Recorders
Electronic Flowmeters
Electronic Feed Water Controls
Miniature Remote Indicators

THE hays CORPORATION

MICHIGAN CITY 12 INDIANA

When inquiring check CP 2016 on handy form, pgs. 2-3

Acetate ink adheres to smooth plastic film, glass

Carbon suspension in acetate ink has covering power of india drawing ink, but is so stable that it can be used in some fountain pens and withstands freezing and thawing without harm. Good adhesion on glass, smooth cellulose acetate, cellulose nitrate, methacrylate, and numerous water repellent smooth plastic surfaces are claimed.

Tests show strong wear and heat stability, and indicate that ink trace is not flaked by repeatedly rolling film. It is a two-minute drying ink. Work done with this ink can be rendered water resistant by brief heat cure at 180°F. Manufacturer advises that transparent colors, suitable for projection, will be available soon. Though primarily designed for smooth plastics, black ink is also recommended for general purpose drawing, in which its non-clogging quality is an advantage.

(Fearon's ink is a product of Electrochemical Laboratories, Dept. CP, 1430 Terrace Dr., Tulsa, Okla. . . . or for more information check CP 2017 on handy form, pages 2 and 3.)

Boiler heat exchanger tubes restored to operation by use of inserts . . .

Venturi effect retains original rate of flow

Uses: To restore leaking condenser or boiler heat exchanger tubes to service by sealing off deteriorated portion of tube.

Features: No special labor or tools are needed for installation of inserts. They retard or eliminate effect of inlet end erosion. Although inside diameter of insert is less than inside diameter of tube, insert is shaped to have a venturi effect which substantially reserves original rate of flow through tube.

Description: Standard condenser tube insert is five inches long and consists of a pliable acid resistant plastic coating firmly bonded to a metal tube of an alloy most suitable for conditions of particular application. Inserts can be used for services up to 250°F. Five-inch aluminum-brass inserts are carried in stock. Special inserts are manufactured to meet requirements.

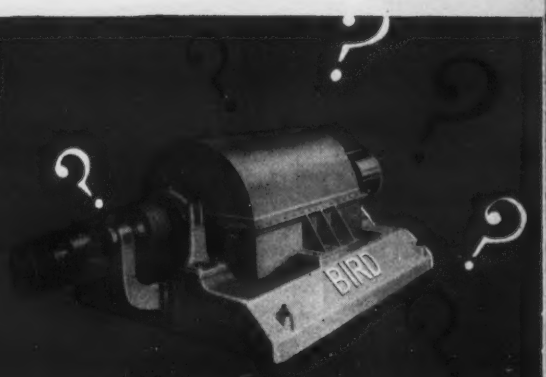
(Product of Thomas C. Wilson Co., Inc., Dept. CP, 21-11 44th Ave., Long Island City 1, N.Y. . . . or for more information check CP 2018 on handy form, pages 2 and 3.)

No need to search high and wide . . .

for more information on something you read in these editorial articles. A letter to the company listed at the end of the article . . . or a mark on the Reader Service slip . . . will bring you what you want. This idea originated with Putman Publishing Co. many years ago . . . to help busy men like you!

THE EDITORS

WHAT DO YOU WANT IN A FILTER?



HIGH CAPACITY

A small size (18" x 28") Bird Continuous Centrifugal Filter washes and dewaters salt crystals from an organic solution. It delivers tons of salt per hour with only 3% moisture content. 99% plus of the organic material is recovered, using only 0.2 lbs. of wash water per lb. of salt.

LOW MAINTENANCE

A Bird Filter used on heavy duty war service on chemicals for explosives has kept right on producing for mining industry needs. In ten years of steady operation the Bird has only been dismantled once and that only for a check up.

THOROUGH SEPARATION

One small Bird Filter handles 28.000 lbs., dry weight per day of an important agricultural chemical. Feed consistency is 32% solids. Temperature, 25°C. Solids discharge contains less than 5% solvent. Filtrate is essentially clear.

CONTINUOUSLY DEPENDABLE OPERATION

You put BIRDS in and they run and keep on running. Thirty-three Birds are now on the job for this one company on eight different materials. The first were put in ten years ago. Since then there have been eleven repeat orders.

Why not find out what the Bird Centrifugal Filter can do for you? *The Bird Research and Development Center* is ready to provide pilot scale test data in advance of your equipment investment. Findings will be unbiased because Bird builds all types—*Continuous Centrifugal Filters and Classifiers, Continuous Vacuum Filters, Batch Centrifugals.*

BIRD MACHINE COMPANY

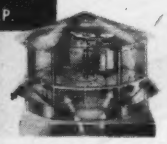
SOUTH WALPOLE • MASSACHUSETTS

When inquiring check CP 2019 on handy form, pgs. 2-3

You can be sure GALLAHER CERTIFIED RATINGS mean *Peak Performance*

HERE'S WHY

NEW Belt Drive 4000 to 65,000 CFM up to 4" S.P.

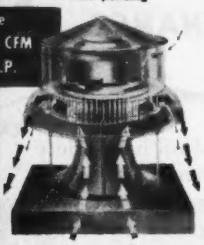


Gallaher ratings are the result of actual physical tests of the entire unit — **not** a fan wheel alone or other component, **not** interpolations of free air data, but a true picture of the unit as it operates under actual conditions.

Any other method of rating a power roof exhauster will be inaccurate. Gallaher research has shown conclusively that the errors may run as high as 50% when ratings are mere theoretical calculations.

Pat. No. 2526290 2188741
Pats pending

Direct Drive 100 to 11,000 CFM up to 4.2" S.P.



Gallaher units with patented, built-in **scroll effect** are the only power roof exhausters which can develop high static pressures. With this feature, thousands of industrial applications are well within the range of economical power roof exhausters. They have been rated in an independent laboratory under the direction of a nationally recognized authority under the conditions prescribed by NAFM and ASH&VE.

Before you buy power roof exhausters we think you'll agree that these three questions should be answered to your satisfaction. 1. How were the tests conducted? 2. Did it include the whole unit and not a component? 3. What impartial authority conducted the tests? We think that you'll buy Gallaher Air-Vans.

For full information write Dept C-6

The GALLAHER Company
4120 Dodge Street Omaha, Nebraska

When inquiring specify CP 2020 on handy form, pgs. 2-3

COMPLETE Jacketed Pipe and Fluidometer Systems

for all liquid-handling problems

● In any processing operation where the maintenance of a uniform temperature in the process pipes is necessary, a Hetherington & Berner jacketed system will assure dependable, economical production. This is equally true regardless of whether the material being handled requires a hot or cold temperature, what heating or cooling medium is used, or whether the material is corrosive or non-corrosive. Write for Bulletin J-50. If you have a liquid batching problem, involving either light or heavy liquids, jacketed or unjacketed construction, investigate the *Fluidometer System.* This system gives accurate, dependable and *completely automatic* batching and is adaptable to practically any liquid measuring problem, whether it involves gallons, barrels or tank cars. Write for Bulletin FI-49.

H&B ESTABLISHED 1887

HETHERINGTON & BERNER INC.
711 KENTUCKY AVE. INDIANAPOLIS 7, IND.

When inquiring specify CP 2021 on handy form, pgs. 2-3

High tensile strength featured by steel filter sheet

Porous stainless steel filter sheet, designated Grade X, is said to be distinguished from previously available materials by an approximately doubled tensile strength. Material is available in the form of finished line filters. Tensile strength of the porous material is said to be approximately 25,000 psi.

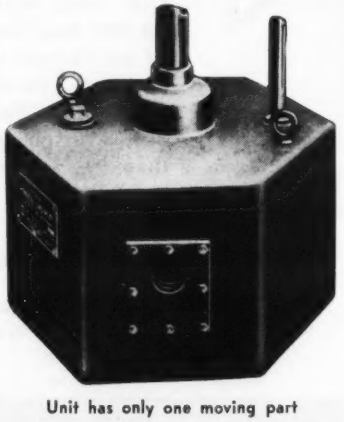
Material is available from stock in .040" thickness, with a mean pore opening of 10 microns. Other thicknesses ranging from .020" up

to 1/8" can be obtained. An example of a fabricated filter is shown in the illustration.

(Product of Micro Metallic Corp., Dept. CP, 35 Sea Cliff Ave., Glen Cove, N. Y. . . . check CP 2022 on handy form, pages 2 and 3.)

Total simplicity featured in pneumatic ejector

Uses: For pumping low-volume, problem materials. Pneumatic ejector is said to be capable of handling any liquid that will flow into it, including: abrasive liquids, acids,



Unit has only one moving part

alkalis, brine, molten metals, molten salts, oils, paints, sludges, slurries, and water.

Features: Compactness of design and the presence of only one mov-

LOOK AT THESE PROPERTIES OF DU PONT TEFLON*

For gaskets, packings and other process equipment, Du Pont "Teflon" offers this unique combination of properties:

- **CHEMICAL INERTNESS** — completely unaffected by acids, alkalis, aliphatics, aromatics, chlorinated hydrocarbons . . . all chemicals except molten alkali metals and fluorine.
- **HEAT RESISTANCE** — continuous service up to 500°F.
- **LOW TEMPERATURE TOUGHNESS** —as low as -320°F.
- **NON-ADHESIVENESS** — the tackiest materials show little tendency to stick to "Teflon."
- **LOW COEFFICIENT OF FRICTION** —either against itself or other materials.
- **ZERO MOISTURE ABSORPTION**
- **WEATHER RESISTANCE**

The Du Pont Polychemicals Department supplies "Teflon" in the forms of molding powders and aqueous dispersions. We'll gladly suggest names of processors of sheets, rods, tubes and finished parts. For full information, write: E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Room 166 Du Pont Bldg., Wilmington 98, Del.

DU PONT
REG. U.S. PAT. OFF.

**Trademark for Du Pont tetrafluoroethylene resin*

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

When inquiring specify CP 2023 on handy form, pgs. 2-3

Jam-packed with cost-cutting, efficiency-boosting characteristics, the Johnson Joint offers exciting possibilities you should know about. It's a packless, self-lubricating and self-adjusting way to get heating or cooling agents in or out of rotating machine parts; used on calenders, dryers, ironers, mills and similar machines. There are hundreds of design and production problems for which it holds the perfect answer.

Write for complete literature

The Johnson Corporation
826 Wood St., Three Rivers, Mich.

When inquiring specify CP 2024 on handy form, pgs. 2-3

ing part, a ball inlet valve, makes unit easy to install, simple in operation, according to manufacturer.

Description: The "Pneu-Pump" is practically immune to high temperatures; will pump liquids near the boiling point. Unit is available with choice of: cast-iron, lead-lined, rubber-lined, or stoneware bodies. It is adaptable to the pumping acids and other corrosives.

Pump can be operated from existing compressed air supply, from a separate compressor, or by means of a simple auxiliary apparatus which can be actuated by steam.

(Product of Yeomans Brothers Co., Dept. CP, 1999 N. Ruby St., Melrose Park, Ill. . . . or for more information check CP 2025 on convenient Reader Service slip between pages two and three.)

Wet locations OK for metal wiring conduit

Four-page, 3-color bulletin describes flexible metal electrical wiring conduit which is UL approved for use in wet locations. Conduit is also recommended for wiring installations which are subjected to oil, movement, or even vibration.

Conduit, Type UA Sealtite, is bound by a tough, extruded synthetic cover which protects wiring from moisture, oil, dirt, chemicals, and corrosive fumes. Conduit is made of spirally wound, inter-locked zinc-plated steel strip with a copper bonding conductor wound spirally in space between each convolution on inside of conduit.

Bulletin includes specifications and illustrates typical installations of conduit. Also included is a brief description of an extra flexible conduit.

Bul UA-530 is issued by The American Brass Co., American Metal Hose Branch, Dept. CP, Waterbury 20, Conn. When inquiring specify CP 2026 on convenient Reader Service slip between pages 2 and 3.

For more information on product at right, specify CP 2027 . . . see information request blank between pages 2 - 3.

for BIG volume pumping?

You get a new high in service from Fairbanks-Morse *Angleflow* Pumps. They're designed for BIG volume pumping against moderate heads — sizes range from 8 to 54 inches . . . capacities up to 80,000 GPM.

You can move big volumes of sewage or storm water too, with *low* operating and maintenance costs. These Angleflow Pumps, with their wide, unobstructed impeller and volute passages, are especially suitable for handling debris-filled water.

For information, see your local Fairbanks-Morse Pump Engineer . . . or write Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE

a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY
RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

PIGMENT MANUFACTURER BREAKS PRODUCTION BOTTLENECK WITH READCO MIXERS

A large producer of water soluble paint pigments faced a problem confronting many management men . . . how to get more production—in a hurry.

In an analysis of his process, a bottleneck was found. Pigment solids were being removed from the emulsion in filter presses. Unmanageable filter cake was being scraped from the presses and shoveled into drums, a costly, time-consuming process.

A series of laboratory tests pointed out the simple solution. A battery of Readco Spiral Ribbon Mixers was installed beneath the presses. These mixers reduce the cake into a homogeneous, semi-liquid mass, ready for shipment. Processing time and costs have been greatly reduced.

You can approach your production problems in the same way. The Read Standard Corporation not only manufactures a broad line of chemical processing equipment, it offers you the services of its engineering specialists and laboratory facilities to assist you in the solution of your special processing problem.

READ STANDARD
CORPORATION

BAKERY-CHEMICAL DIVISION, York, Pennsylvania—Los Angeles 39, California

When inquiring check CP 2028 on handy form, pgs. 2-3

Good mileage given by fast-setting label glue

Uses: As a label glue.

Features: Casein ice-proof labeling glue is said to set fast, have excellent water resistance even in room-temperature water, and to give uniform results all year around. According to manufacturer, the glue gives good mileage since it can be applied in a very thin, quick-setting film.

Description: Designated Ice-Proof Glue 45N445, the product is a soft, easy spreading, slightly pasty material with sufficient flow to follow the glue wheel. It is said to work perfectly clean and to show absolutely no throwing.

With use of product there is said to be no shifting or displacing of labels, even on short runs. Since glue is not temperature sensitive, it is stated that uniformity of results can be obtained constantly. The glue works equally well on all types of labels.

(Product of National Adhesives, Div. of National Starch Products, Inc., Dept. CP, 270 Madison Ave., New York 16, N. Y. . . . or for more information check CP 2029 on convenient Reader Service slip between pages 2 and 3.)

Production, maintenance equipment presented

Equipment for better maintenance, safety, and production is described and illustrated in 64-page catalog. Products are divided into 5 general classifications: (1) commutator, motor, and generator maintenance; (2) electrical and mechanical maintenance; (3) metal working tools; (4) flexible shaft machines; and (5) general safety equipment.

Offered on a "satisfaction or money back" guarantee, products range from rotary files and burs to industrial vacuum cleaners. Complete specifications are given for each product mentioned in publication.

Cat 29 is issued by Martindale Electric Co., Dept. CP, Box 617, Edgewater Branch, Cleveland 7, Ohio. When inquiring specify CP 2030 on handy form, pages 2 and 3.

Everlasting Valve Weight-Operated with Pendulum Stop

Controlled thermostatically, electrically or manually from any or many locations

Closing Type—For emergency shut-off of inflammable liquids

Opening Type—For automatic drains on tanks containing paint, oil, etc.

These valves are positive in action and will unfailingly respond the instant the weight is released.

WRITE FOR BULLETIN

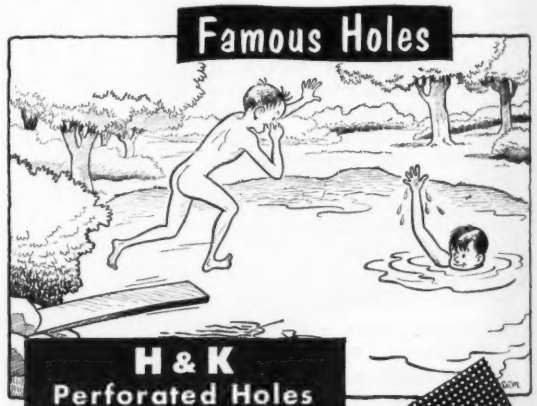
EVERLASTING VALVE CO., 49 FISK STREET, JERSEY CITY 5, N. J.

Everlasting Valves

TRADE MARK "EVERLASTING" REG. U. S. PAT. OFF. EV-3688

FOR EVERLASTING PROTECTION

When inquiring check CP 2031 on handy form, pgs. 2-3



H & K Perforated Holes

A refreshing experience — the ol' swimming hole — and so it will be when you send your perforating problems to us. "If it can be perforated, H & K can do it" is a reputation of which we are proud. Whether your requirements are small or large, we are interested. We specialize in difficult perforating, involving stainless, plastics, small perforations and precision work. In over seventy years our perforating facilities have grown to be the most complete in the country.

Ask for Catalog No. 62 for complete information.

The Harrington & King Perforating Co.

5636 Fillmore Street, Chicago 44, Illinois
114 Liberty Street, New York 6, New York

When inquiring check CP 2032 on handy form, pgs. 2-3

Twenty per cent more capacity in same space reported for storage batteries

Uses: Where increased capacity is needed in many material handling and haulage jobs to work through a full shift.

Features: Polyethylene non-oxidizing slotted plastic tubes keep active material in constant contact with grid spines, yet permit free electrolyte penetration throughout the active material. Added feature is polyethylene acid-proof tube-sealer fitted to bottom of positive plate, which seals in active material and maintains high battery capacity for a longer working life. Grids contain corrosion-resistant Silvium, which also contributes to longer battery life.

Description: Battery is essentially an Exide Ironclad with materials and structural changes to give it increased capacity. Positive plates in battery are larger, and are balanced by extra heavy negative plates. Pormax separators, homogenized sealing compound, and seamless rubber jars are other materials contributing to the performance of battery. Steel trays are sprayed with plastic coating which is acid-resistant and possesses high insulating qualities. Quarter-turn unbreakable plastic vent plugs facilitate quick and easy servicing with water.

("Thrifty Hauler" battery is product of The Electric Storage Battery Co., Dept. CP, Box 8109, 1945 Allegheny Ave., Philadelphia 32, Pa. . . . or reader may secure more information by simply checking CP 2033 on handy Reader Service slip between pages 2 and 3.)

Efficient air purification guaranteed

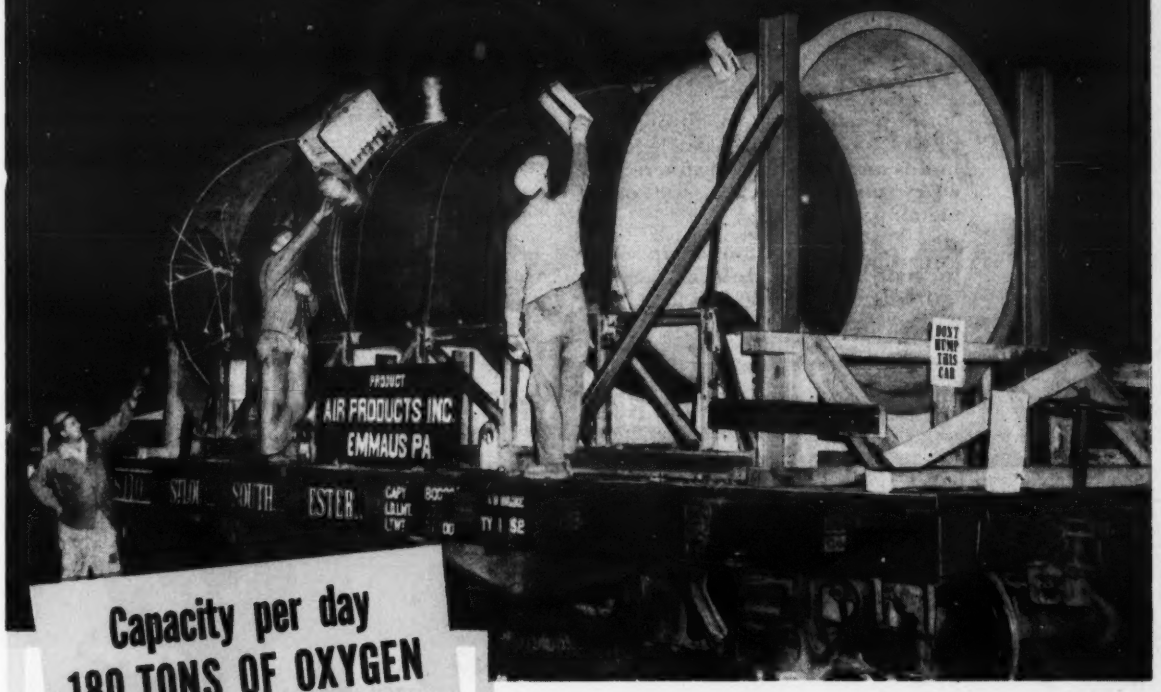
Four-page, two-color bulletin describes and illustrates construction and function of space filter. Although efficiency of filter is unconditionally guaranteed at least 99.95 per cent effective against particles 0.3 micron in diameter, it has proved effective in filtering tobacco smoke — average particle size 0.05 to 0.10 micron — according to manufacturer. Silene-treated, filter fibers are made of imported Bolivian or African blue asbestos and Esparto grass.

Two primary fields of use are listed: product and process control, and health protection. These fields include protection against inert and radio-active dusts in film manufacture and processing; protection during processing of pharmaceuticals, delicate instruments, lenses, paints, plastics, and electrical and electronic equipment. Filters may also be used as a health safeguard for radio isotope users, atomic energy plants, and wherever employees may work with beryllium, aniline dyes, steel, chemicals, or other toxic materials.

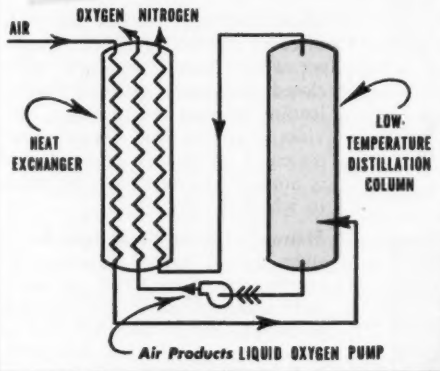
Bul 1505-1 is available from Mine Safety Appliances Co., Dept. CP, Braddock, Thomas, and Meade Streets, Pittsburgh 8, Pa. When inquiring specify CP 2034 on handy form, pages 2 and 3.

Giant Oxygen Distillation Column

...part of an *Air Products* Generator for SPENCER CHEMICAL'S new ammonia plant



Capacity per day
180 TONS OF OXYGEN
350 TONS OF NITROGEN



SIMPLIFIED DIAGRAM of the *Air Products* Generator for Spencer, which will separate oxygen and nitrogen from liquid air. *Air Products* columns of this type also used for low-temperature scrubbing of synthesis gas, hydrocarbon separation, etc.

ON ITS WAY to Spencer Chemical Co.'s new ammonia plant in Vicksburg, Miss. Spencer awarded *Air Products* the contract to design and manufacture a complete Oxygen-Nitrogen Generator.

When in operation, this generator will produce 180 tons of oxygen and approximately 350 tons of high-purity nitrogen per day. Spencer will use the oxygen to produce hydrogen (H), then combine this with the nitrogen (N) to produce ammonia (NH_3).

What are your requirements?

Air Products offers low temperature apparatus custom-made for all gas separation processes, plus a standard line of Oxygen-Nitrogen Generators. Write us your requirements.

Serving the **STEEL, CHEMICAL, PETROLEUM** *and* **ELECTRONICS** *Industries*

Air Products INCORPORATED

Dept. K, Box 538
Allentown, Pa.

When inquiring check CP 2035 on handy form, pgs. 2-3

IN A FILTER OR STRAINER IT'S

design
accuracy
craftsmanship

FOR BETTER SERVICE

"CLEVELAND" FILTERS AND STRAINERS

No task too big — no problem too small for CLEVELAND strainers and filters. We design, build and produce strainers and filters for every purpose in any size or dimension or metal.

Easy to order — our engineers will help you to analyze your problem. Send us your requirements!

WRITE FOR BULLETIN NO. 7

THE CLEVELAND WIRE CLOTH & MFG. CO.

3574 E. 78 STREET · CLEVELAND 5, OHIO

When inquiring check CP 2036 on handy form, pgs. 2-3

for
• SPRAYING • WASHING • RINSING • COOLING • AIR CONDITIONING

Get the most out of your Spraying Equipment with minimum power . . . with efficient spraying.

Use Yarway Nozzles. No internal vanes or other restrictions to clog or hinder flow. Two types—Yarway Involute-type producing a fine hollow spray with minimum energy loss, and Yarway Fan-type producing a flat fan-shaped spray with time-saving slicing action for cleaning.

Wide range of standard sizes and capacities. Cast or machined from solid bar stock.

Thousands in use. Write for Bulletin N-617.

YARWAY SPRAY NOZZLES

YARNALL-WARING COMPANY

125 Mermaid Avenue, Philadelphia 18, Pa.

When inquiring check CP 2037 on handy form, pgs. 2-3

CONSTRUCTION

Manual effort alone gives tight seal closing on manway

Uses: As access to pressure vessels for maintenance or inspection.

Features: Time consuming opening, closing, and sealing operations are said to be eliminated by this manway.

Description: Operation is simple. Welding lugs on frame match similar lugs on cover. Cover is joined to frame by two free fit pins held by cotters. Both pins are freely removable from locking position by lifting up; either pin may be quickly withdrawn, while other remains in place as cover supporting hinge.

Tight seal closing is accomplished by manual effort, without any tightening device. Frame is machined with smooth internal recess and protective lip which receives a delta section molded gasket of Hycar or silicone rubber. Interior periphery of cover is smooth finished to register with frame recess, and when closed compresses gasket. Further loading by pressure in vessel provides a positive seal. Gasket is not cemented, is quickly replaced, and is protected from damage by recess in which it rests.

No tightening device necessary

Manway is available in four frame styles for all normal mounting requirements. Sizes based on actual clear inside diameter are available in 16, 18, 20, 24, and 30", and in service ratings of 150, 300, 400, and 500 lb. Q-ring seal can be provided for vacuum service.

(Product of Lenape Hydraulic Pressing and Forging Co., Dept. CP, West Chester, Pa. . . . or for more information check CP 2038 on handy Reader Service slip between pages two and three.)

MAKE YOUR NEXT STEEL VALVE A BROWN VALVE

PROMPT DELIVERY
COMPLETE STOCKS

VERNON offers you the complete line of the famous Brown Valves. Used the world over for more than a quarter of a century, these valves are recognized throughout industry for their superior design, precision machining and dependable performance.

Brown STEEL VALVES

Write today for Engineering Data

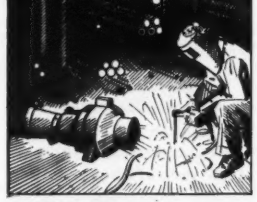
A complete line of cast steel, swing check valves for use on steam, oil, oil vapor, gas and water. Available in most sizes for working pressures from 150 lbs. to 2500 lbs. Also complete line of globe, angle and steam throttle valves.

BROWN VALVE DIVISION
VERNON TOOL CO., LTD.
1101 Meridian Ave. Alhambra, California
5822 Harvey Wilson Dr. Houston 20, Texas

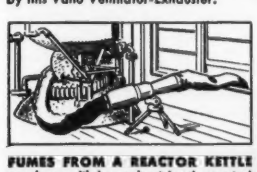
CENTRIFUGAL PUMPS • DESANDERS
VIBRATING SCREENS
PIPE CUTTING PANTOGRAPHS
STEEL VALVES • STUFFING BOXES

When inquiring check CP 2039 on handy form, pgs. 2-3

Ventilate CONFINED Places with Vano Design "C" Ventilator-Exhauster



WELDING FUMES are here removed by this Vano Ventilator-Exhauster.



FUMES FROM A REACTOR KETTLE are here withdrawn by tripod-mounted Vano Ventilator-Exhauster. Note non-collapsible suction tubing and discharge tubing.

Ideal for withdrawing welding fumes from confined places or directly from the welding rod. Provides greater safety, greater comfort for workers . . . leads to greater work efficiency. Can be furnished with 8" suction inlet to which 8" non-collapsible suction tubing may be attached . . . or provided with multiple inlet nozzles for 5", 4" and 3" suction hose.

Other types are also available for supplying fresh air to men working in confined places, such as tanks, manholes, drums, boilers and shipholds.

Coppus Engineering Corporation
386 Park Ave.
Worcester 2, Mass.

ANOTHER COPPUS "BLUE RIBBON" PRODUCT

When inquiring check CP 2040 on handy form, pages 2-3

Machine down-time due to chain failure is reduced by riveted roller chain . . .

single pin coupler link offers ease of assembly

A step in the direction of solving the problem of machine down-time due to chain failure and replacement has been taken with an easy-to-assemble riveted roller chain. This chain combines long-wearing characteristics of riveted roller chain with the ease of assembly and disassembly of cottered chain, according to manufacturer. Chain is supplied in ASA standard and heavy series, 1" through 2½" pitch sizes in multiple widths. It is made up in ten foot lengths of riveted chain, having an exclusive single pin coupler installed at convenient intervals. Couplers are placed in assembled chain so any length can be made up without damaging parts.

Single pin coupler link makes this possible. A single pin, easily removed, disconnects the chain — and center links or spacer plates cannot move or fall out when disconnecting chain. One end of the single pin coupler link is firmly riveted to the adjacent link. Other end contains single coupler pin. One end of pin is spun over a washer, and other end has a milled flat and locking pin hole. Pin is an easy fit throughout the chain — except for milled flat end which is press-fitted into the matching hole of coupler link plate. Thus, it is only necessary to drive the pin the length of its milled flat in assembly or disassembly.

Each ten-foot section of chain is boxed individually and any even pitch length of chain up to ten feet can be made from one box of chain. Odd pitch lengths can be obtained by using a three pitch riveted offset section. Lengths greater than ten feet can readily be obtained by combining additional ten foot sections.

(Improved Baldwin Assembly Riveted Roller Chain is a product of Baldwin-Duckworth, Division of Chain Belt Co., Dept. CP, Springfield 2, Mass. . . . or for more information check CP 2041 on handy form, pages 2 and 3.)

Data on buffing compounds

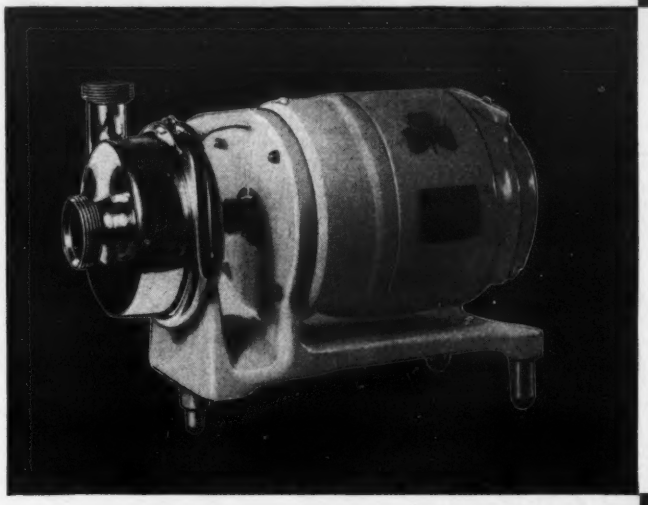
Technical bulletin presents specification and use data on company's buffing compounds which are manufactured in two types: water dispersible and standard, completely saponifiable.

According to manufacturer, water dispersible grades will completely disintegrate and disperse in hot water. This type and the standard, completely saponifiable type are free of paraffin, mineral oil, and other petroleum products. Cleaning with alkalies is sufficient to remove either type of compound from intricately designed pieces without leaving oily films or buffing residues. Both compounds may also be removed readily by conventional degreasing procedures.

Bul T-4 is available from The Globe Compound Co., Dept. CP, Waterbury-Bristol Rd., Waterbury 12, Conn. When inquiring specify CP 2042 on handy form, pages 2 and 3.

You'll find all the features you want in

TRI-CLOVER PUMPS



"Pump King" Unimount Series

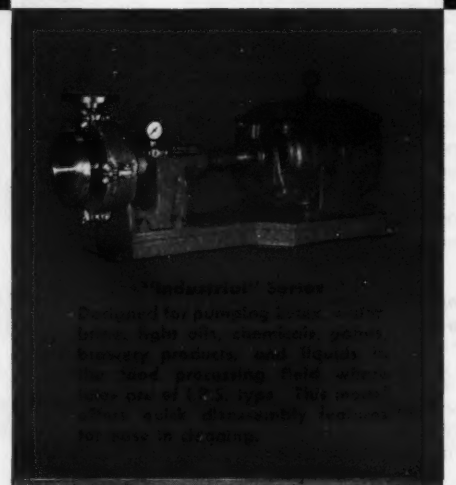
Designed for very efficient operation at 1800 and 3600 RPM, and especially where high speeds are required, through heaters, coolers, filters, clarifiers, etc. The 3600 RPM model is especially applicable in the dairy industry where high head and low capacity are essential and for handling low and medium viscosity liquids in the food processing industry.

OVER 30 years of continuous improvement is embodied in today's line of Tri-Clover centrifugal pumps.

The "Pump King" Sanitary Series—the Standard Sanitary Series—and the Industrial Series—all have exclusive Tri-Clover pump features that mean better, more efficient liquid transmission.

Patented screw type impeller with sanitary impeller clip—inert carbon seal that is easily removed and cleaned—streamlined, lightweight head with a minimum number of parts—simple, fast pump assembly and disassembly with the new Ring Clamp construction—these are just a few features that make Tri-Clover Centrifugal Pumps ideally suited for food, chemical, dairy, and industrial requirements for sanitary and corrosion-resistant service.

Benefit from these important advantages when looking for a solution to your pumping problems.



Tri-Clover®
MACHINE CO.
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

THE Complete LINE

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

See your nearest Tri-Clover distributor, or write for a copy of Pump Catalog 250.

P-153

When inquiring check CP 2043 on handy form, pgs. 2-3

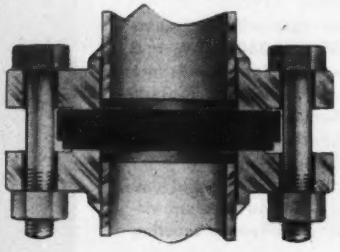
Positive seal assured by metal aligning gaskets . . .

flange seals on misalignment up to 6°

Uses: Metal aligning gaskets are for flange sealing applications.

Features: Gaskets assure positive seal on misalignment up to 6°, according to manufacturer. They can be used with all standard fittings, and are available with O-ring or metal to metal fit.

Description: These flange gaskets are designed to prevent leakage due to misalignment. They are made of different metals according to application and can be used for



Flange gaskets can be used with all standard fittings

all fluids, gases, and air. Simple to install, gaskets combine strength, safety, and leak-proof permanence and will never require maintenance, according to manufacturer.

(Vic-O-Seal flange gaskets are a product of Vickers, Inc., Div. of The Sperry Corp., 2160 E. Imperial Highway, El Segundo, Calif. . . . or for more information check CP 2044 on handy form, pages 2 & 3.)

Rusting prevented by use of "inhibited salt"

Uses: Compound, added to salt to inhibit possible corrosive effects, was used initially for rust-proofing military products and later to provide "inhibited salt" for de-icing streets, highways, and parking lots. More recent uses of compound, called Banox, are as a rust inhibitor, in conjunction with salt, for refrigerated freight cars; in salt refrigeration brine used in various food processing and storage functions; and in salt used for regenerating zeolite water softeners.

Features: Solutions formed by melting ice or snow (or water),

HERE'S AN EXAMPLE of how Armstrong data help you select the right size trap for the job:

Armstrong trap capacity figures are based on literally hundreds of tests under actual operating conditions with condensate at steam temperature. The choking effect of flash steam through the orifice as well as the back pressure created by flash steam were automatically taken into account. Actual hookups were used to allow for the effect of pipe friction.

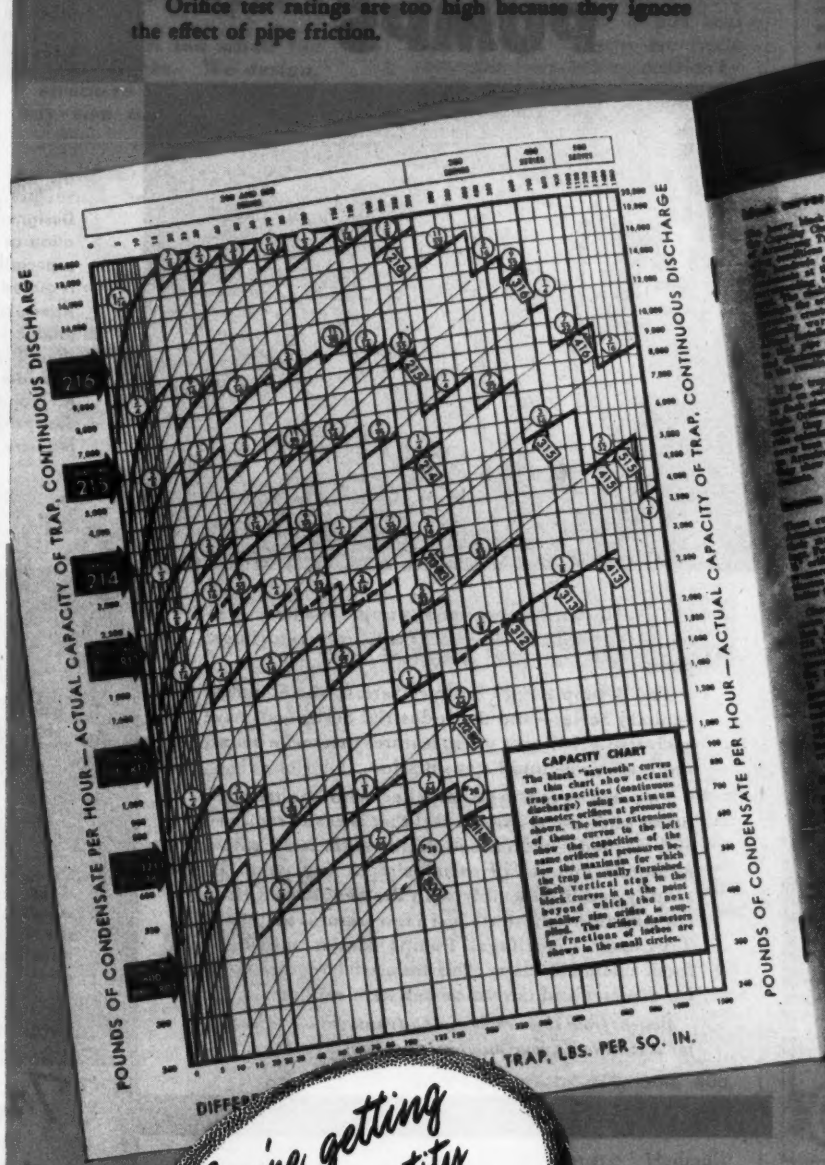
If the capacity ratings had been based on cold water tests, which produce no flash steam they would be too high.

Orifice test ratings are too high because they ignore the effect of pipe friction.

Slide rule calculations of trap capacities have never been conservative.

WHEN YOU SPECIFY A STEAM TRAP you are specifying condensate handling capacity. When you use Armstrong Selection Data and specify Armstrong traps YOU KNOW that you are getting the right trap for the job.

Armstrong traps last longer, too—with less maintenance. And, they are *unconditionally guaranteed* to give complete satisfaction.

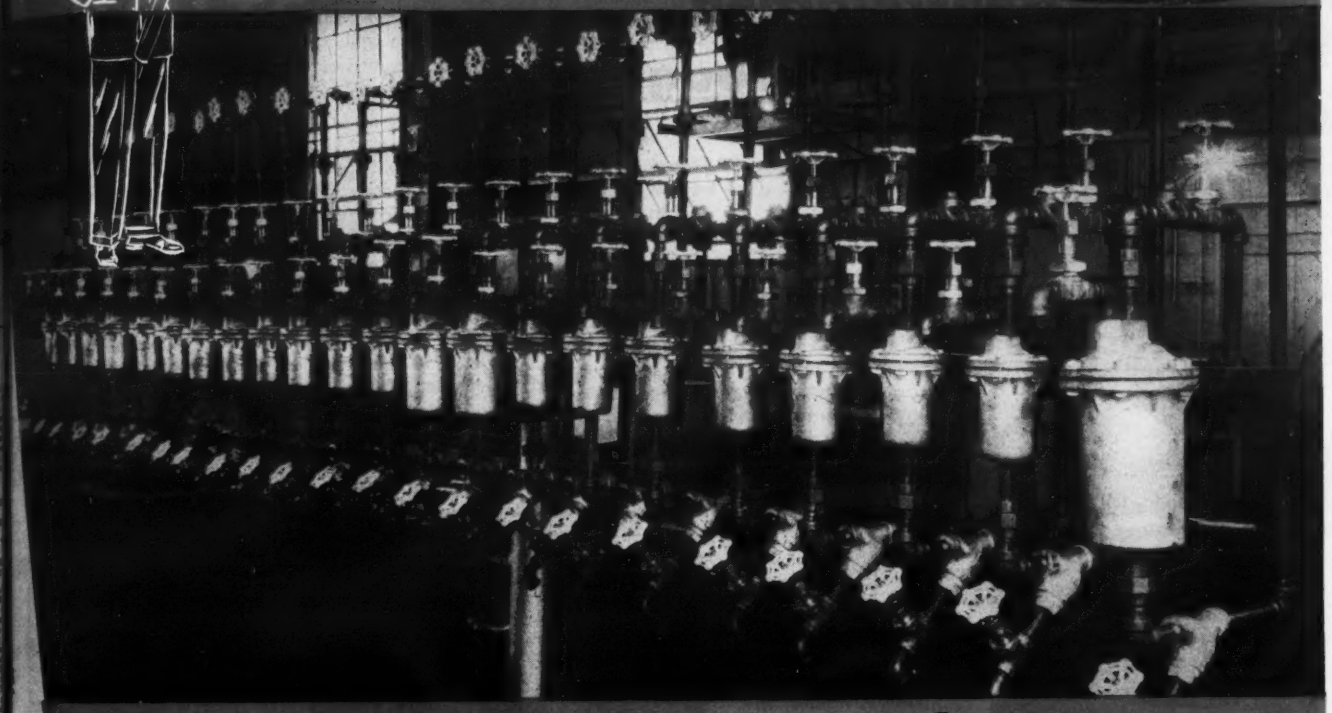

POUNDS OF CONDENSATE PER HOUR—ACTUAL CAPACITY OF TRAP, CONTINUOUS DISCHARGE
POUNDS OF CONDENSATE PER HOUR—ACTUAL CAPACITY OF TRAP, CONTINUOUS DISCHARGE
CAPACITY CHART
Don't Forget—

Pages 22 and 23 of the Armstrong Steam Trap Book.

You're getting a known quantity when you specify

ARMSTRONG

No trial and error on that job . . . . ARMSTRONG TRAP DATA are Reliable



THE most carefully calculated installation of steam-heated processing equipment will fail to deliver full output if the steam traps do not have adequate condensate and air handling capacity. When this happens an important part of the capital investment in plant and equipment is wasted.

After you have figured the amount of steam that will be condensed, you need data on:

Condensate Capacity—not theoretical, not estimated, not cold water, but actual test findings with traps discharging condensate at steam temperature (see the discussion on the left-hand page).

Trap Capacity Safety Factors, or ratio between continuous discharge capacity and actual amount of condensate to be handled. These may run from a low of 2 to 1 or as high as 8 to 1. Armstrong data tells you just what safety factor to use to obtain adequate air venting capacity and maximum heat transfer.

Armstrong trap data helps you get traps "big enough" for the job, but not too big; assures you maximum operating efficiency; eliminates corrections after installation. For traps and trapping assistance call your nearby Armstrong Factory Representative.

ARMSTRONG MACHINE WORKS
880 Maple St., Three Rivers, Michigan

Left—Side Inlet—Side outlet traps for pressures to 250 lbs. for sizes.

Right—Forged steel traps for pressures to 1500 lbs. screwed, socket weld or flanged connections.

Left—Bottom Inlet—Top outlet traps for pressures to 250 lbs. for sizes.

Send for the NEW 44-page Steam Trap Book—including 14 pages of data on how-to size traps for nearly every type of equipment. Free on request—no obligation.

STEAM TRAPS

salt, and rust inhibitor deposits a very thin, tightly adherent protective film on clean or rusty metal surfaces. This film, by preventing oxygen from reaching metal surface, inhibits and prevents possibility of corrosion.

Description: Compound, an amorphous polyphosphate, when added to sodium chloride creates an "inhibited salt." It is a granular material which mixes readily with rock or crystallized salt and may also be incorporated into compressed salt or pellets. It is said to be non-toxic, harmless to leather, rubber, paint, clothing fabric, the skin and eyes, and to animals.

Banox is supplied in either of two forms: colorless, or colored so the presence of a rust inhibitor in salt brine would be identified. A harmless, non-staining fluorescent coloring agent is incorporated in the colored compound.

(Banox is a product of Calgon, Inc., Dept. CP, Hagan Bldg., Pittsburgh 30, Pa. . . . or for more information check CP 2045 on convenient Reader Service slip between pages two and three.)

Colors are guide to products in electric catalog

Catalog of electric equipment contains complete listings of safety switches, circuit breakers, service entrance equipment (both fusible and circuit breaker types), motor control, and extensive line of panel boards. Various product sections are separated by colored divider sheets, thus simplifying use of catalog.

Engineered type products, such as Flex-A-Power distribution systems and Centr-A-Power switchboards and control centers, are also fully described.

Trumbullist, 1953 edition, is issued by Trumbull Electric Dept., General Electric Co., Dept. CP, Plainville, Conn. When inquiring reader may simply specify CP 2046 on convenient Reader Service slip between pages two and three.

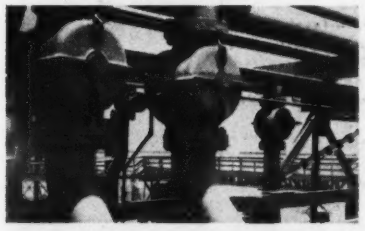
For more information on product at left, specify CP 2047 . . . see information request blank between pages 2 - 3.

Non-retarded straight-through flow

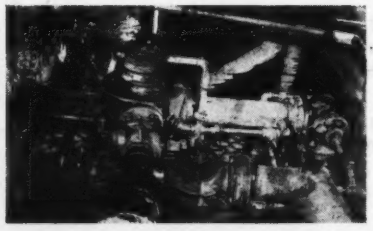
is guaranteed by a.c.f.'s Round Port Valves because the valve opening is *exactly* the same size and shape as the pipe itself.
As a result you get full capacity flow of heavy viscous ladings, no loss in head pressure. Materials in suspension have no abrasive effect

Full pipe area and the non-wedging effect of CYLINDRICAL Plug Design is also available in a.c.f. Rectangular Port Valves. It will pay to get all the facts about *both* before you buy. Call your nearby a.c.f. Representative now or write direct for information.

IN PETROLEUM AND GAS INSTALLATIONS a.c.f. Valves provide full flow with no pressure loss, fastest sure operation.



IN PROCESSING a.c.f. Round Port Valves are ideal for such materials as cement slurry with straight-through uninterrupted flow



TWELVE YEARS OF SERVICE for these a.c.f. Valves handling hot asphalt is evidence of service-free performance.

a.c.f. CYLINDRICAL FULL PIPE AREA **PLUG VALVES**

Write for Catalog 4. American Car and Foundry Company, Valve Division, 1501 E. Ferry Ave., Detroit 11, Michigan.

Representatives in 50 Principal Cities

When inquiring check CP 2048 on handy form, pgs. 2-3

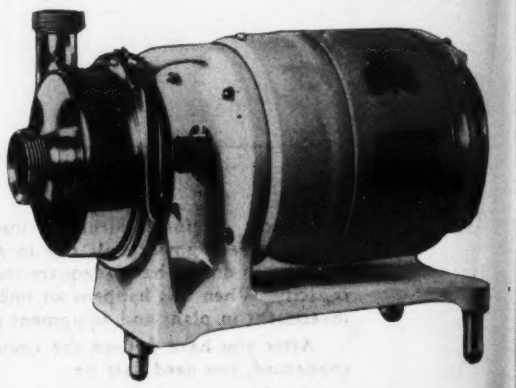
Fast, easy assembly and disassembly featured in centrifugal pumps

Uses: Pumps will handle any liquid that will flow to them and are reportedly designed to give efficient transmission with low cost maintenance.

Features: These corrosion-resistant centrifugal pumps feature an exclusive casing construction which permits fast, easy pump assemble or disassembly, patented screw type impellers with sanitary impeller clips, inert carbon seals easily removed for cleaning, and streamlined lightweight heads with a minimum of parts.

Description: Pumps have fast, non-clogging centrifugal action with special seals for practically every requirement, according to manufacturer. They are available in a complete line of sizes and capacities up to 1250 gpm, and to 250 feet of head at zero gallons per minute.

"Pump King" unimount series here illustrated is said to be designed for efficient operation at 1800 and 3600 rpm, and especially where high speeds are required, through heaters, coolers, filters, clarifiers, and like equipment. The 3600 rpm model is



Designed for efficient operation at 1800, 3600 rpm

especially applicable where high head and low capacity are essential, and for handling low and medium viscosity liquids.

Industrial corrosion-resistant pumps are designed for pumping latex, water, brine, light oils, chemicals, paints, brewery products, and liquids in the food processing field where lines are IPS type.

(Product of Tri-Clover Machine Co., Dept. CP, Kenosha, Wis. . . . or for more information check CP 2049 on convenient Reader Service slip between pages two and three.)

Describes tools for plumbers, steamfitters, machinists

Twelve-page, illustrated catalog describes company's line of tools for plumbers, steamfitters, and machinists. Equipment presented includes: pipe and strap wrenches; pipe and bar vises; and pipe

threaders and cutters. Complete specifications are given for all tools.

Cat 353 is available from The Erie Tool Works, Dept. CP, Erie, Pa. When inquiring specify CP 2051 on convenient Reader Service slip between pages two and three.

Increase of 300 to 500% in number of thread inserts installed with nylon prewinder tool . . .

nylon sleeve of unit has lifetime guarantee

Uses: For installation of helically wound wire stainless steel thread inserts. These inserts are specified as original equipment in metalworking, plastics, and process equipment fields, as well as in other industries. In addition, inserts are used in production salvage — to repair threads damaged during manufacturing operations — and in maintenance operations where they simplify restoration of threads damaged during prolonged use. Inserts are applied in aluminum, magnesium, copper alloys, plastics, and fiber.

Nylon prewinder tool permits effortless installation of wire thread inserts

Features: According to supplier, actual tests by users of nylon inserting tool indicate that it will complete from three to five times as many installations as former tool that was used. Insertion of wire threads is said to be effortless with tool. Lifetime guarantee accompanying tool states that if user ever breaks nylon sleeve in service, he need only return tool to manufacturer and it will be replaced at no charge.

Description: Prewinder thread in tip of the tool compresses diameter of the wire thread insert and aligns its helix to match the helix of the tapped threads to be protected. Slotted mandrel with a crank handle engages the tang on the insert.

Turning the handle winds insert into nylon prewinder thread. Tapered nose of prewinder then is placed against tapped hole. Further turning of the handle threads the insert into the tapped hole — the tool acting as a thread guide.

Installation is said to be facilitated by the compressing and guiding action of the tool — combined with the large nylon sleeve which permits a firm grasp. A number of sizes of tool is available to fit company's entire line of thread inserts.

(Prewinder tool is furnished by same company supplying helically wound wire inserts, Heli-Coil Corp., Dept. CP, 1285 Shelter Rock Lane, Danbury, Conn. . . . or for more information reader may simply check CP 2052 on convenient Reader Service slip between pages two and three.)

THREADED SPECIALTIES

EYE BOLTS

by an exclusive method

Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

BETTER BOLTS SINCE 1882

PAWTUCKET

"THE BOLT MAN"

MANUFACTURING COMPANY

327 Pine Street Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

When inquiring check CP 2050 on handy form, pgs. 2-3

acids . . . gases . . . hot liquids . . .

SOLVE YOUR SPECIAL PACKING PROBLEMS..

WITH JOHN CRANE CHEMLON® "C-V" RINGS

for CORROSION-FREE PACKING SERVICE IN PUMPS AND VALVES....

You can effectively handle any corrosive liquid or gas by repacking your valves and pumps with "John Crane" Chemlon "C-V" Rings. Molded from the remarkable material, Teflon, "John Crane" Chemlon "C-V" Rings are impervious to almost every known chemical substance. They withstand extreme temperatures from −94° to +482°F—have extremely low friction coefficient. "Breakout" friction is only slightly higher than that of running friction. Special cross sectional design affords positive sealing at practically finger-tight gland pressure.

To bring you all the important advantages of Teflon for your particular sealing problem or application, "John Crane" has developed a complete line of Chemlon "C-V" Rings and male and female adapters. If you have special requirements, additional sizes can be molded to fit your stuffing box dimensions.

"John Crane's" illustrated booklet "The Best in Teflon" contains extensive information on a wide variety of Chemlon Products. Send for your free copy. Crane Packing Co., 1821 Cuyler Ave., Chicago 13, Ill.

*DuPont's trademark for tetrafluoroethylene resin

JOHN CRANE CRANE PACKING COMPANY

When inquiring check CP 2053 on handy form, pgs. 2-3

CHIKSAN takes a Compressor's Pulse

Keeps Gas Flowing— Absorbs Vibration of Changing Pressures

Not only do the stamina and flexibility of Chiksan Joints take expansion in their stride, they absorb pulsation and vibration.

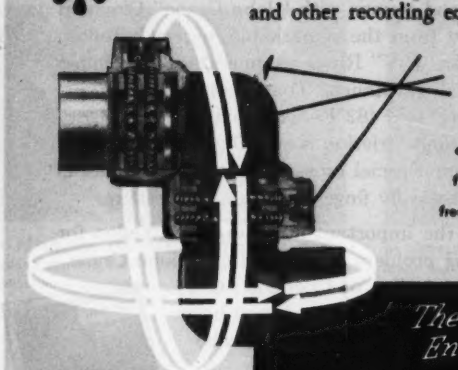
When the Plymouth Oil Company wanted a better way to handle the expansion and contraction of its 2500-3500 lb. natural gas re-pressuring line in its compressor station in Sinton, Texas, back in 1946, it tried Chiksan 2-inch high pressure ball bearing swivel joints. So successful were Chiksan Joints in this application, they were adopted for 3 and 4-inch lines for the same purpose. In addition, by placing regulators, gauges and other recording equipment on a bridge using Chiksan Joints, accurate readings of the instruments could be obtained.

Since 1946, not one of these Chiksan Joints has been replaced or even repacked, and they are giving the same economical, dependable service they did when first installed.

In Texas or California — all over America and all around the world — wherever production, processing or distribution depends on the flow of liquid or gas or on the dependability of hydraulic systems, there you will find Chiksan Ball Bearing Swivel Joints on the job — adding muscle and flexibility — cutting down on shut-downs and maintenance.

Whatever your business, if gas or liquid plays a part, Chiksan's Research and Development Division can help you add efficiency, safety and economy to your operation.

Representatives in Principal Cities
Write for Catalog 53-C, Dept. CP-6



CHIKSAN Ball Bearing Swivel Joints are THE NEW TOOL of Modern Industry — with full 360° rotation in 1, 2, and 3 planes. Over 1,000 different types, styles and sizes have been developed for pressures and services from 28" vacuum to 15,000 psi and for temperature ranges from minus 75° to a plus 500° F. with packing materials for each specific type of service.

The Flow of Enterprise Relies on **CHIKSAN** *Ball-Bearing Swivel Joints*

CHIKSAN

CHIKSAN COMPANY • BREA, CALIFORNIA • Chicago 28, Illinois • Newark 2, New Jersey
Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Chiksan Export Company (Subsidiary), Brea, California • Newark 2, N. J.

When inquiring check CP 2054 on handy form, pgs. 2-3

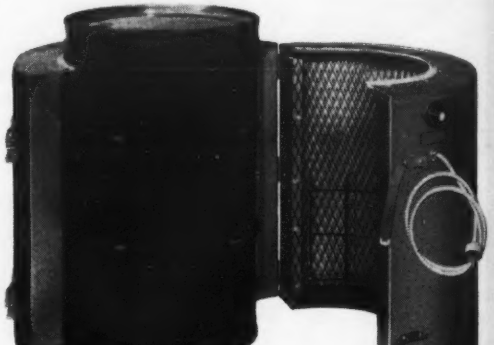
Viscous liquids flow easier if drum is warm . . .

and portable, hinged, controlled-temp electric oven makes heating job a simple one

Uses: Warms drums. Suggested for use when drums contain materials which are viscous at room temperature, but can be made to flow at higher temps.

Features: Controlled temperature prevents burning or discoloration of material in drum.

Description: Automatic Drum Warmer is a portable, hinged electric oven that fits closely around a standard steel drum. It is constructed with a 2" thick Fiberglas insulation all-around. Made in two sizes — for 55 and 30 gallon drums — the unit



Temperature at drum warmer can be closely controlled

can be supplied for 208, 230, and 460 volt, single or 3 phase power supply. Choice of two thermostat ranges is offered: 100 to 450°F, and 60 to 250°F.

(Made by Harold L. Palmer Company, Dept. CP-P-3, 2980 W. Davison St., Detroit 6, Mich. . . . or for more information check CP 2055 on handy form, pages 2 and 3.)

Stone, concrete, and refractories quickly cut and pierced with 8000°F arc rod . . .

eliminates time-consuming drilling of holes in masonry for installing equipment

Uses: For cutting and piercing stone, cement, concrete, and refractory materials. A typical application is drilling of holes in masonry for installing equipment. Another concerns pipes buried in masonry which present a problem when they require attention. Problem is simplified with electrode, which pierces masonry and exposes pipe. Should metal pipe then require cutting, another electrode may be placed in welding machine and entire operation carried out by one operator. Method has numerous other possible industrial applications.

Features: Arc rod permits piercing of solid concrete and similar materials in a matter of seconds, according to manufacturer. Holes can be made

much more quickly and easily than by conventional drilling procedure.

Description: Stone piercing electrode creates its own arc. It requires no ground and does not have to be struck upon metal. Operator has complete control at all times and he alone determines when and where the arc will start. Arc will operate in mid-air as well as it will upon stone. It has characteristics of a torch flame 5 to 8" in length and produces a temperature of 8000°F.

Technically, electrode is a self energizing arc rod. Heavy coating, formulated to give the thermo-chemical inter-reaction with the arc stream to react with the non-metallic material, is reduced more slowly than the core. This forms a crucible or tube of coating through which the tremendous energy is concentrated into a fine tip. Its character has been changed by the disintegrating coating. Thermal ionization of the coating by the arc stream combined with the concentration produces the conditions necessary to pierce and melt the refractory material.

Whenever a DC welding machine of 400 amp or more is available, the method may be used. No compressors, air lines, oxygen tanks, pneumatic drills, or other equipment are needed. Only the conventional welding machine and a supply of the electrodes are required.

(DynArc stone piercing method utilizing DynaTrode arc rods is development of ChemoTec Div., Eutectic Welding Alloys Corp., Dept. CP, 40-40 172 St., Flushing, N. Y., N. Y. . . . or for more information check CP 2056 on convenient Reader Service slip between pages 2 and 3.)

Plastic mold life increased by use of fast-drying release compound

Uses: As a mold release for polyester, epoxy, and phenolic resins. Product is used on steel and other non-porous surfaces. It is said to be effective for low-pressure, glass-fiber laminating as well as for compression or transfer molding. Excessive sticking of other plastics and non-plastics may also be prevented by this solution.

Features: In the plastic industry, use of this product should result in fewer rejects, increased mold life, and lower maintenance costs, according to manufacturer.

Description: Product is fast drying and is intended for production work. It is long lasting and one application will usually last for many cycles. It is easy to handle and can be applied by spraying, brushing, or wiping with a cloth saturated in the solution. Solution does not react with above resins or inhibit their cure. On heated dies, there has been no sign of carbonization or build-up reported. It is colorless and clean. It has a low surface tension and quickly spreads over the entire mold surface.

(CD Mold Release B is a product of Chemical Development Corporation, Department CP, Danvers, Massachusetts . . . or for more information check CP 2057 on convenient Reader Service slip between pages two and three.)

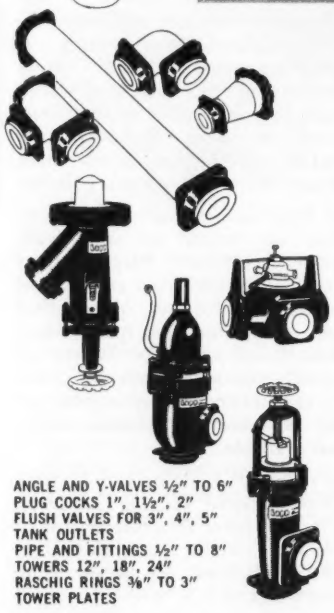
SAFEST way to handle acid corrosion

SAFE from corrosion

SAFE from contamination

SAFE for plant and personnel

Lapp CHEMICAL PORCELAIN



ANGLE AND Y-VALVES ½" TO 6"
PLUG COCKS 1", 1½", 2"
FLUSH VALVES FOR 3", 4", 5"
TANK OUTLETS
PIPE AND FITTINGS ½" TO 8"
TOWERS 12", 18", 24"
RASCHIG RINGS ⅜" TO 3"
TOWER PLATES

For problems involving severe corrosion, or elimination of contamination, best bet is a material chemically inert to product being handled—and it should be hard, smooth, strong, and non-porous.

That's a description of Lapp Chemical Porcelain—and a list of characteristics which have won it a permanent place in hundreds of plants, and hundreds of processes, where no other material ever gave as satisfactory service.

The bonus is that it costs a lot less initially than most corrosion-resistant alloys and lined equipment. And the economy is increased in the fact that it almost never needs maintenance or replacement.

We want to make special mention of the item "safe for plant and personnel." Lapp Porcelain is much tougher and stronger than most people give it credit for. However, under severe shock, physical or thermal, it will break. In the past we've supplied our equipment with several types of armor. Today, we've got the simplest, most economical, and best. We call it TUFCLAD. It consists of multiple layers of heavy fiberglass woven cloth, impregnated and bonded with an Epoxide resin. This armor shell acts as a cushion against impact damage, and insulator against thermal shock. But most important, it is of itself strong and tough—will hold line pressures even when porcelain is cracked or broken.

For your problem of corrosion or contamination, Lapp Chemical Porcelain may bring you a new standard of untroubled service, improved quality and lowered cost. Write for description and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 160 Wendell St., Le Roy, N. Y.

When inquiring check CP 2058 on handy form, pgs. 2-3

it's LIGHTWEIGHT

it's CORROSION-RESISTANT

it's WELDCO

For any special problems—for all your regular tubing applications—Weldco gives you long, dependable service at the lowest possible cost. Weldco is highly resistant to corrosion, easy to fabricate, bend, form and weld. In addition, it offers a smooth inside finish, light weight, exceptional strength, and complete uniformity all the way through.

Weldco is available in Monel, Stainless, Inconel, Nickel and other alloys, in sizes from 3" to 30" O. D. Other sizes for special applications. Whenever you need light-weight, high-strength tubing, specify Weldco and be sure of getting the best.

Whatever Your Needs In Tubing . . . You're Way Ahead With WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3711 OAKWOOD AVE. • YOUNGSTOWN, OHIO

When inquiring check CP 2059 on handy form, pgs. 2-3

Use of interchangeable components cuts cost of metallic rectifier

Uses: Power supply for electroplating and anodizing.

Features: Equipment is said to be substantially lower in price than former units because of extensive use of interchangeable standardized components.

Description: Line includes manually controlled and automatically regulated power supplies, as well as special equipment for barrel plating and precision laboratory work. Maximum operating economy in each rating is achieved by using a variety of circuits and either copper-oxide or selenium rectifier stacks, depending on output used.

DC ratings for manually and automatically regulated systems range from 500 amperes at 6 volts to 2000 amperes at 48 volts. Units for barrel plating are available in ratings from 500 amperes at 6 volts to 2000 amperes at 12 volts. Laboratory platers are rated 50 amperes at 9 volts and 65 amperes at 18 volts.

Saturable reactor control is employed on manually and automatically regulated power systems. A single operator's control station controls entire DC output of system regardless of number of individual units employed. Manually controlled systems may be converted at any time to automatic regulation.

In lower ratings, controls and rectifiers are housed in same wall-mounted cabinet. Larger ratings are floor-mounted, and employ unit construction for ease of shipment and installation. No special foundations are required. Where especially corrosive atmospheres will be encountered, power supplies using oil-immersed selenium stacks are available.

(Product of Lighting and Rectifier Dept., General Electric Co., Dept. CP, One River Rd., Schenectady 5, N. Y. . . . or for more information check CP 2060 on handy form, pages 2 and 3.)

Folder features fastenings

Pocket-size, accordion-type folder features company's line of corrosion-resistant fastenings. Available metals and sizes of

YOU COULD
SANDBLAST
A DeZURIK
VALVE-PLUG

. . . . And It Still Wouldn't Leak!

You can punish the plug in a DeZURIK EASY-OPERATING VALVE with just about any abrasive material . . . in pulp or suspension . . . month after month . . . yet the DeZURIK VALVE functions leak-free and dead-tight every time you close it.

Abrasive materials bounce off the tough, resilient face of the DeZURIK plug. If they lodge on the valve-seat, they still can't prevent the conforming plug from closing down tight around them.

DeZURIK PLUG VALVES are non-lubricated, totally friction-free. All sizes, types & metals, for manual or instrument control. Data on request.

De ZURIK
Shower Company
Sartell, Minn.

Made in England by Millspaugh, Ltd. — Sheffield

When inquiring check CP 2061 on handy form, pgs. 2-3

Nicholson Steam Traps

CUT THIS HEAT-UP CYCLE 40%

Primarily to solve a freeze-up problem on their jacketed kettles, an Eastern processor replaced mechanical traps with Nicholson thermostatic units. But, in addition, they found heating time was shortened 40%. Credit is given the higher, more even temperatures which Nicholson traps effect. See why leading plants are increasingly standardizing on Nicholsons for faster heat transfer. 5 types: size ¼" to 2"; press. to 250 lbs.

181 Oregon St., Wilkes-Barre, Pa.

W. H. NICHOLSON & CO.
TRAPS · VALVES · FLOATS

When inquiring check CP 2062 on handy form, pgs. 2-3

R/M Teflon*

PACKINGS

for the chemical industry

R/M No. 835—Teflon Valve Stem Packing

R/M No. 845—Teflon Braided Packing

R/M No. 810—Solid Teflon Gaskets

The R/M Teflon Packing line includes solid rings, Vee-Flex® rings, braided and plastic packings, solid spacers and adapters, packings for stuffing boxes and valve stems, "envelope" gaskets, solid gaskets in round, square and irregular shapes. Teflon is inert to all commercial chemicals. If you fabricate special parts like pump impellers and valve discs, order R/M Teflon rods, sheets and tubes to your own specifications. Write for catalog.

**Du Pont trade-mark for its tetrafluoroethylene resin*

R/M PACKINGS

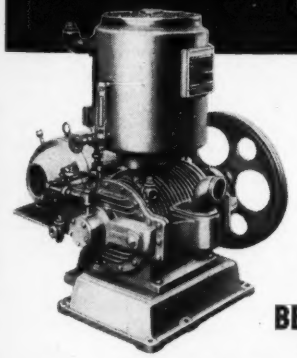
RAYBESTOS-MANHATTAN, INC.

PACKING DIVISION, MANHEIM, PA.

When inquiring check CP 2063 on handy form, pgs. 2-3

DO YOU NEED VACUUM

up to 10 microns or more?



You get down to your working vacuum faster with

BEACH-RUSS

TYPE RP

ROTARY VACUUM PUMPS

They also give you longer service life and lower maintenance costs, because of their superior mechanical efficiency.

WRITE FOR RP PUMP BULLETIN

BEACH-RUSS COMPANY

46 CHURCH STREET · NEW YORK 7, N. Y.

When inquiring check CP 2064 on handy form, pgs. 2-3

bolts, nuts, screws, washers, rivets, and specials are included in descriptive material.

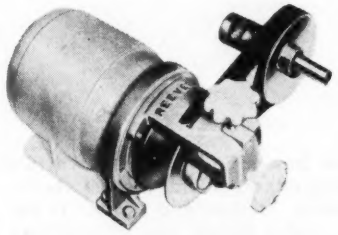
Folder on Everlasting Fastenings is issued by The H. M. Harper Co., Dept. CP, 8251 Lehigh Ave., Morton Grove, Ill. When inquiring specify CP 2065 on convenient Reader Service slip between pages 2 and 3.

Flexibility of application offered by variable speed drive unit . . .

can deliver any desired speed within 8 to 1 ratio

Uses: Adaptable to essentially all industrial applications, including those with in-line or right angle reducers, countershafts, chain and sprocket, or V-belt drives.

Features: Flexi-Speed drive is a unit which combines flexibility in operation and application. Unit may be mounted in almost any position around driven equipment, may drive in any direction, and can deliver any desired speed within a ratio of 8 to 1.



Drive may be mounted in almost any position

Description: Speed control handwheel may be located parallel to or in any of eight positions perpendicular to motor shaft. Six different length belts offer wide choice of shaft center distances. Said to be inexpensive to install and maintain, drives are available in ½, ¾, and 1 horsepower capacities.

According to manufacturer, Flexi-Speed drive is idea for driving standard gear reducers for parallel drives, or worm gear reducers for inexpensive right angle drives.

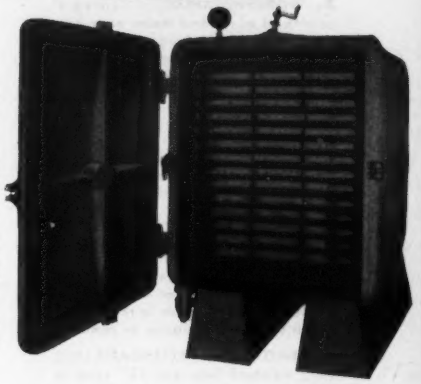
(Product of Reeves Pulley Co., Dept. CP, Columbus, Ind. . . . or for more information check CP 2066 on convenient Reader Service slip between pages 2 and 3.)

Dry it Faster, Better, with

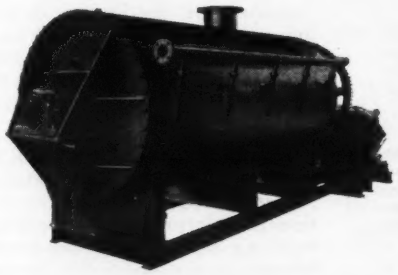
Devine VACUUM DRYERS

POSITIVE CONTROL PERFECT UNIFORMITY

VACUUM CHAMBER DRYER



Devine Vacuum Chamber Dryers are designed to dry drugs, foods, chemicals and other materials that must not be subjected to high heat, or agitated or broken while drying. Material is dried on heated shelves under vacuum. Heat and vacuum can be regulated, providing positive control of drying process. Available in either cast iron or fabricated steel.



VACUUM ROTARY DRYER

Devine Vacuum Rotary Dryers consist of a jacketed steel shell equipped with a revolving paddle or ribbon-type agitator with or without a central heating tube. Designed for low-temperature drying of materials that may be mixed or tumbled while drying, they may also be used for solvent recovery

Devine Engineers, as specialists in drying equipment, have found the answer to many a tough drying problem. If there is a drying step in your process, they can help you. Inquiries invited.

J. P. DEVINE MFG. CO., INC.

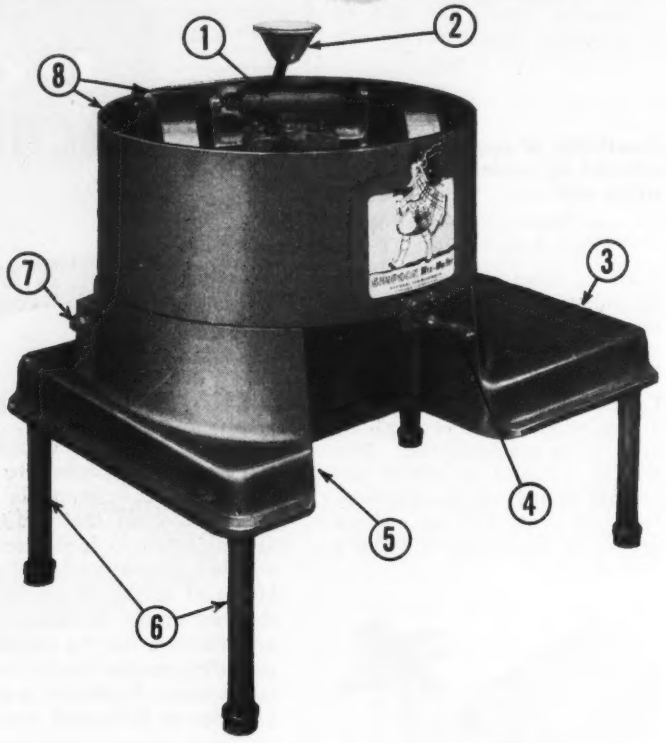
49th STREET AND AVRR PITTSBURGH 1, PENNSYLVANIA

Devine PROCESS EQUIPMENT

When inquiring check CP 2067 on handy form, pgs. 2-3

Here's your modern "Mortar and Pestle" for accurate laboratory mixing

The NEW SIMPSON LF MIX-MULLER



1. SPRING-LOADED MULLERS . . . designed to exert more or less pressure, as adjusted. Mullers weigh only 30 lbs. but can be adjusted to exert up to 80 lbs. pressure.

2. ADDITIONS FUNNEL — DUST COVER . . . arranged so the funnel directs liquid additions *directly* to the material bed — without removal of dust cover or splashing of liquids. Tight fit of light spun-metal cover assures dust-free operation. (Hood not shown in photo.)

3. WORKING AREA . . . Integral casting of mixer and motor base provides adequate working area for tools or other laboratory appliances . . . also assures proper and permanent alignment of drive.

4. CIRCULAR LEAK PROOF DISCHARGE DOOR . . . machined for tight fit and smooth operation. Large door, clear space provides for quicker discharge of batch.

5. V-BELT DRIVE — TORQUE ARM REDUCER . . . completely yet accessibly enclosed beneath base plate. V-Belt drive assures flexible operation . . . and easier, lower maintenance. Vertical mounted motor is readily accessible for maintenance or removal.

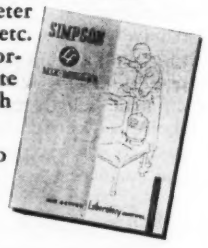
6. REMOVABLE OR EXTENDABLE LEGS . . . standard legs are 12" long to provide a 33" desk high working height. The legs may be removed for table or other mounting . . . or extended to fit individual needs.

7. TORQUE ARM ADJUSTING NUT . . . permits exterior adjustment of V-Belt. An inspection plate (at rear) may be removed for visual adjustment or replacement of belt.

8. CRIB AND MULLER SCRAPERS . . . assures ease of cleaning, no "build up" of material, and are vital to many specialized mixing jobs. Integral design of crib, turret and bedplates also provides quicker, easier cleaning.

THE laboratory mortar and pestle has long been the world's "number one" method for establishing mixing standards and checking quality and efficiency. Your *modern* "mortar and pestle" is the new Simpson LF MIX-MULLER . . . with a special pair of revolving mullers and plows to provide the rubbing and smearing action that so thoroughly blends components into a uniform, inseparable mass.

Manufactured to the same exacting standards as the full line of larger Simpson MIX-MULLERS, the 24" pan diameter LF has all components—mullers, turret, crib, etc. . . . including batch capacity—scaled down proportionately. It provides a simple, extremely accurate working duplication of production mixing, for both laboratory and pilot plant service.



Bring modern "mortar and pestle" accuracy to your laboratory mixing. Consult a National engineer today.

Write for Bulletin 515.

SIMPSON MIX-MULLER® DIVISION

NATIONAL ENGINEERING CO., 624 Machinery Hall Bldg., Chicago 6, Ill.

(Not Inc.)

When inquiring check CP 2068 on handy form, pgs. 2-3

Second motor ventilates, cleans power unit of vacuum cleaner . . .

offers solution to one-person operation, care

With a powerful motor to provide 56-inch water lift vacuum and a second motor to ventilate power unit and keep it free of water and dirt, Vacu-Master offers solution to one-person operation and maintenance in wet and dry pickup operations and furnace cleaning. Unit is especially quiet in operation. Its light weight and easy rolling casters make it especially well liked by feminine maintenance personnel, it is reported.

Unit holds a bushel of dirt or 10 gallons of water

Cleaner holds a bushel of dirt or ten gallons of water, passes over 220 cubic feet of air per minute and eliminates the need for sweeping before scrubbing operations. After scrubbing, Vacu-Master picks scrubbing solution by suction off floors of wood, brick, mosaic, inlaid linoleum, rubber, or other types of floors.

This service eliminates mopping and the streaks that mopping often entails. Unit is said to do its job so swiftly and thoroughly that grouting, cement which holds tile and other composition floors to base floors, is preserved from rot and deterioration.

When used as a furnace cleaner, unit operates with disposable paper filter flameproof bag which holds one bushel of dirt. This bag is inside the can, above the dirt while cleaner is in operation. Dirt is bagged when can is turned upside down after use. Outer cloth bag, reinforced with a wire frame, surrounds the paper bag. Thus, costly bag blowouts are impossible and no time is lost cleaning the bag.

(Vacu-Master is a product of Empire Chemical Products Co., Dept. CP, 10 Longworth St., Newark, N. J. . . . or for more information check CP 2069 on handy form, pages 2 and 3.)

Brightness control for buildings provided by flat glass laminate for windows . . .

reported to eliminate need for blinds, louvers, hoods, or other shading devices

Uses: For ribbon windows and ventilating units used in conjunction with functional glass block installations in buildings.

Features: This special control glass is said to reduce brightness to comfortable seeing levels. According to manufacturer, it eliminates need for sup-

plementary light control assistance from blinds, louvers, hoods, or other shading devices.

Description: Product is composed of two layers of window glass laminated with an inner layer of neutral grey vinyl plastic. It is manufactured by same process as Duolite automotive safety glass, glare control being provided by the grey pigment used in the vinyl inner layer.

Since it is a true safety glass, material is shatterproof and will reduce window maintenance and damage from vandalism. It is recommended for glazing elevations facing east, southeast, west, southwest, and points between which are subject to exposure by direct sunlight. Solex glass is recommended for north elevations.

Another advantage of the glass laminate is that it affords a degree of daytime privacy in that it is easier to see through it to the outside than it is to see from the outside in, whenever the outside illumination is greater than that of the interior. It permits adequate visibility of the exterior and causes no appreciable modification of colors indoors or out.

Color of the glass is neutral grey (color free). Visible light transmittance is approximately 25% and solar heat transmittance about 50%. It will be furnished in a standard 7/32" thickness in sizes up to 15 square feet.

(Dusklite flat glass is a development of Pittsburgh Plate Glass Co., Dept. CP, 632 Duquesne Way, Pittsburgh, Pa. . . . or for more information check CP 2070 on handy form, pages 2 and 3.)

Bulletin catalogs causes of threaded pipe joint failure

Four-page, three-color bulletin discusses causes of threaded pipe joint failure and gives data on company's plastic sealing compound. According to bulletin, spiral leakage is main cause of joint failure. This occurs because pipe threads are not cut with sharp peaks and valleys. All standard dies and taps cut off crests and roots of threads, leaving a clearance the length of threaded joint through which fluids can travel and eventually cause corrosion and leakage.

Other causes, which frequently occur simultaneously with spiral leakage, include natural porosity of metals, spiral tool marks, imperfect taper, and out-of-round pipe. Bulletin presents illustrations of these various causes.

Also presented is data on company's plastic sealing compound which, according to manufacturer, eliminates galling and pitting of metal surfaces, withstands temperatures up to 500°F, is insoluble in most liquids and gases, doubles as a gasket paste, seals pressures up to 6000 psi, will not affect stainless steel and other alloys, and which "gels" but never hardens.

Bul B7A is available from Chicago Gasket Co., Dept. CP, 1275 W. North Ave., Chicago 22, Ill. When inquiring specify CP 2071 on handy form, pages 2 and 3.

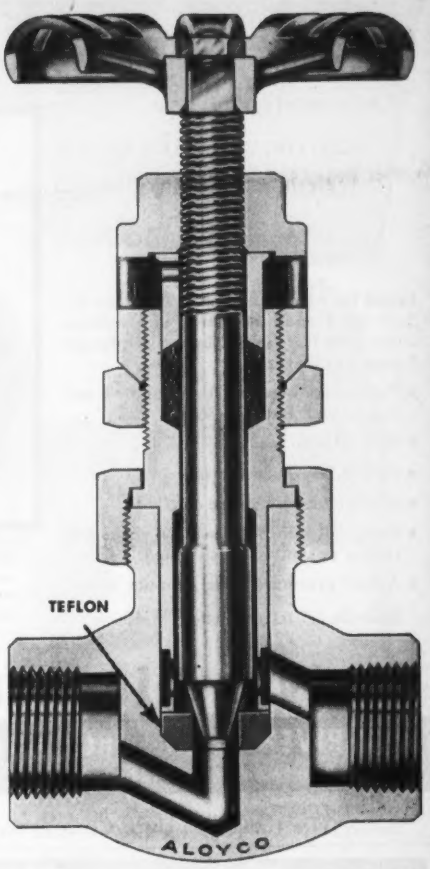
ALOYCO

"TEFLON"-seated valves give Longer Operating Efficiency

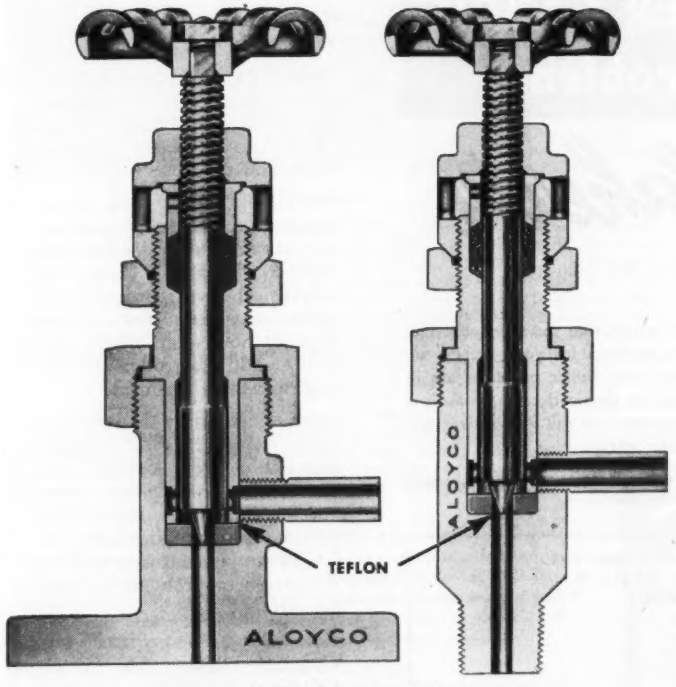
The critical problem of leakage in small valves used for metering, instrument lines, and sampling of corrosives has been solved by the new ALOYCO design features shown here: renewable Teflon seats and exterior threading completely out of the fluid zone.

Teflon is a new material with exceptional properties of toughness, heat resistance and corrosion resistance. It withstands the attack of practically all chemicals at temperatures up to 500° F, and has given leak-free performance for over four years of continuous service in valves handling hot sulphuric acid.

Teflon packing is available in all ALOYCO valves. Teflon renewable seats are available in small valves such as those illustrated and in larger size globe, angle, Y, and check valves. Address your specific corrosion problems to the *Aloyco Corrosion Engineering Service*. Our long and specialized experience in this field is at your service. 3.9



No. 62 Needle Valve, 3000 lb. working pressure, made in sizes ¼ inch through 1 inch. Available in 18-8S (type-304), 18-8SMo (type-316) and Aloyco 20.



SAMPLING VALVES

No. 731—flanged end
150 pound service

No. 732—screwed end
300 pound service

ALLOY STEEL PRODUCTS COMPANY, INC.

1302 West Elizabeth Avenue, Linden, New Jersey

Plants: Linden, N. J.; Bloomfield, N. J.; Elizabeth, N. J.

DISTRICT OFFICES:

NEW YORK 1, N. Y.
350 Fifth Avenue

CHICAGO 4, ILLINOIS
332 So. Michigan Ave.

WILMINGTON, DEL.
226 West Ninth St.

HOUSTON 6, TEXAS
K. E. Luger Co.
2716 Danville St.

PITTSBURGH 22, PA.
318 Investment Bldg.

SAN FRANCISCO, CALIF.
24 California St.

ATLANTA, GEORGIA
333 Candler Bldg.

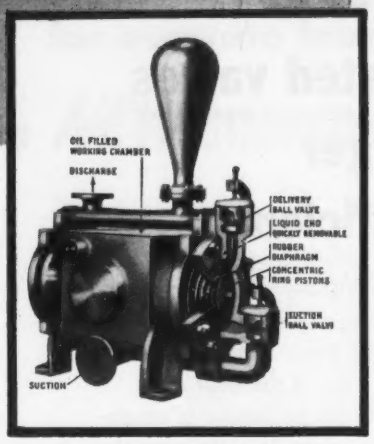
LOS ANGELES 22, CALIF.
5442 Jillson St.

ST. LOUIS, MISSOURI
1221 Locust St.

When inquiring check CP 2072 on handy form, pgs. 2-3

Handle Any Fluid Economically

no matter how
corrosive • abrasive
thick • heavy
viscous



Details of one fluid end: working mechanism completely separated by rubber diaphragms from the fluid handled.

Install the pumps that can really "take it." Save on over-all operating and maintenance costs. Here's why Shriver Diaphragm Pumps last longer —

- No contact between fluid handled and mechanical parts of pump.
- No packings, hence no leakage.
- Easy to inspect and clean.
- Minimum maintenance cost.
- Parts contacting fluid made of any metal, rubber or synthetic resin lined.
- Ample pressure; wide capacity range.

Bulletin 137 tells the story. Write.

Shriver Diaphragm Pumps

T. SHRIVER & CO., Inc. 846 Hamilton St. • Harrison, N. J.
Filter Presses • Filter Media • Diaphragm Pumps

When inquiring check CP 2073 on handy form, pgs. 2-3

for your FILTER FABRIC problem

IMMEDIATE DELIVERY OF THE *RIGHT* FILTER FABRIC FOR YOUR *PARTICULAR* NEED

by *Flaherty*

Specialists in fabrics for industrial filtration

It takes a specialist to prescribe the most effective, least expensive filter medium for your specific requirement. Whatever your fabric problems are in filtration — wet, dry or dust-collection, consult a Flaherty filtration engineer for the *best* answer and *immediate dependable service.*

A complete line of industry-accepted filter fabrics in all weaves, weights and widths.

DYNEL
VINYON N
NYLON
ORLON
SARAN
GLASS
COTTON

Available in yards or rolls, or custom-fabricated

Cut filtering costs! Reduce "down-time" for changes! Send for FREE information TODAY

FLAHERTY Filter Fabrics, Dept. CM5
1025 Clinton Ave., Irvington, N. J.
Phone: ESsex 2-8700

Name .....
Firm .....
Product Filtered .....
Address .....
City ..... State .....

When inquiring check CP 2074 on handy form, pgs. 2-3

Pressures to 5000 psi held by plastic pipe joint compound . . .

material is immune to attack by chemical reagents

Uses: Joint compound is used for plastic pipes and fittings such as Uscolite, Carlon, Saran, Plastex, Kralastic, and Tygon.

Features: Compound, called Pipetite, will hold pressures to 5000 psi. It is inert and non-reactive to chemical reagents. Pipetite is anti-seize. It is able to withstand temperature variations as well as deflections.

Description: Compound will seal against many chemicals, among which are the following: alkalis, ammonia, alcohols, fatty acids, refrigerants, inorganic salts, oxidizing acids, hydrogen peroxide (10%), and chlorine (16%). Pipetite comes in stick form.

(Product of Dept. P, Lake Chemical Co., Dept. CP, 3052 W. Carroll Ave., Chicago 12, Ill. . . . or for more information reader may simply check CP 2075 on Reader Service slip, pages two and three.)

Bulletin covers calendar auxiliary drives

Eight-page, 2-color bulletin covers speed variator auxiliary drives for calendaring coated fabric, floor covering, plastic sheet, and film.

Publication shows how speed variator co-ordinates auxiliary sections and main calendar drive without lineshafts, chains, or mechanical speed changers. It points out design features and explains how speed range, flexibility, and controlled tension and speed are obtained.

Specific auxiliary drives for fabric tension, fabric windup, plastic-film speed control, and plastic-film windup are given special emphasis. Installation photographs and one-line diagrams supplement a combined discussion of problems of each operation.

Bul GEA-5788 is issued by General Electric Co., Dept. CP, One River Rd., Schenectady 5, N. Y. When inquiring specify CP 2076 on handy Reader Service slip between pages two and three.

SR-4® DEVICES IN INDUSTRY.. USES UNLIMITED

THE PROBLEM:

In the static testing of rocket fuel systems, Aberdeen Proving Ground needed a transducer which could respond to the high pressures and frequencies encountered.

THE BALDWIN SOLUTION:

To meet this need, Baldwin designed and manufactured 100 special SR-4 Pressure Cells with the necessary high accuracy and high frequency response.

20,000 p.s.i. high frequency pressure cell. Length 5½", diameter 2", weight 1 lb.

These transducers give Aberdeen these advantages:

1. **High Accuracy**—pressure versus voltage outputs are linear within ¼ of 1% and calibration (span) is held within ½ of 1%.
2. **High Pressures**—capacities up to 20,000 psi.
3. **Limitless Frequency Response**—attached piping or vessel reaches its frequency response limit before the pressure cell reaches its limit.
4. **Versatility**—these SR-4 Pressure Cells are all interchangeable so that they may work into the same instruments. They also work easily into an oscilloscope and can be used to operate a potentiometer.

The *uses* for Baldwin SR-4 devices in industry are *unlimited* . . . measuring load, pressure or torque more accurately and economically. Wide range of standard capacities. Please write Dept. 3206.

TESTING HEADQUARTERS

BALDWIN-LIMA-HAMILTON
Philadelphia 42, Pa. • Offices in Principal Cities

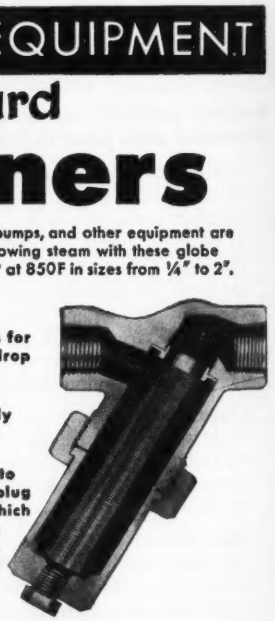
When inquiring check CP 2077 on handy form, pgs. 2-3

PROTECT EQUIPMENT with Edward Strainers

Valves, traps, pressure regulators, pumps, and other equipment are protected from foreign matter in flowing steam with these globe type strainers, rated for 600 lbs SP at 850F in sizes from ¼" to 2".

Features include:

- Drop forged steel bodies
- Streamlined internal contours for free flow, minimum pressure drop
- Rustproof type 316 stainless steel screen has effective perforated area approximately seven times that of internal diameter of pipe
- Strainer easily disassembled to clean screen, provided with plug in the carbon steel bonnet which may be removed for blowing out accumulated matter from inside screen
- Union bonnet construction in sizes to 1", bolted bonnet on 1¼" to 2" sizes
- Screwed or socket welding ends



Write for Bulletin 505 for complete information.

Another Product

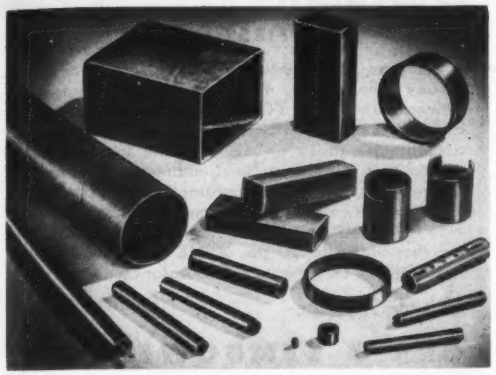
Edward Valves, Inc.

Subsidiary of ROCKWELL MANUFACTURING COMPANY
1230 West 144th Street, EAST CHICAGO, INDIANA

When inquiring check CP 2078 on handy form, pgs. 2-3

Complete line of tubing features all shapes, widths, and lengths

Uses: Tubes can be slotted to specifications for flyback transformers. Small ID sizes are available for use as screw insulators in relays and transformers. Heavy wall tubes provide adequate tensile strength for use as shafts in electrical or electronic applications



Tubes have improved dielectric and other electrical properties, chemical and moisture resistance

in which metal might produce undesirable inductive effects. Tubes of the large OD size can be used in paint rollers for both water- and solvent-base paints.

Features: Tubes are available in all shapes, widths, and lengths. Shapes include round, square, rectangular, and oval. Inner diameters range from .125 to 3", with wall thicknesses from .006 to .100".

According to manufacturer, tubing provides increased wall strength, improved dielectric and other electrical properties, as well as chemical and moisture resistance.

Description: Resinite tubes can be supplied threaded inside or outside, slotted, punched, or embossed. Threaded-coil forms incorporate a three-row design to afford axial pressure in excess of 25 lb. Torque can be controlled to ± 1" oz. Three grades of tubing are available: punching, embossing, and coil-forming. Characteristics and properties of the tubing are:

Density	.302 gm/cc
Power Factor	.0312
Dilectric Strength (short time)	2600 v
Moisture Absorption (avg after 72 hr @ 100% rel humid)	2.68
Volume Resistivity (wall thickness .013", OD .280")	1.2^{12} ohm cm
Coef of Therm Expansion	1.02×10^{-5}
Insulation:	
ohms, ambient	5.55×10^{11}
ohms after humidity	1,990,620

(Product of Dept. K-2, Precision Paper Tube Co., Dept. CP, 2035 W. Charleston St., Chicago 47, Ill. . . . or for more information check CP 2079 on handy form, pages 2 and 3.)

A revolutionary new principle in Coolers . . .

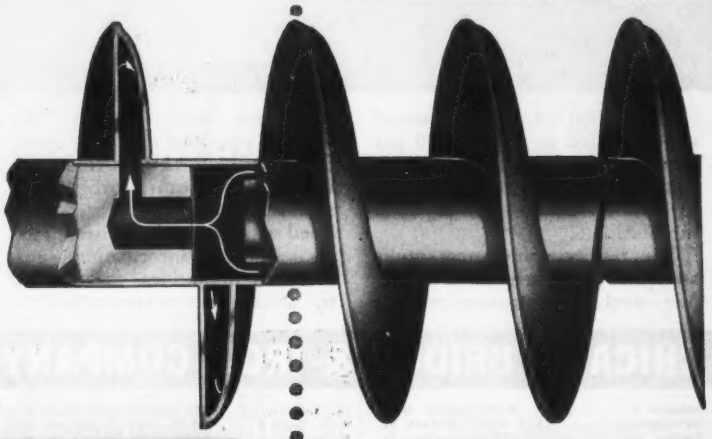
THE **holo-flite*** PROCESSOR

(HOLLOW-FLITE)

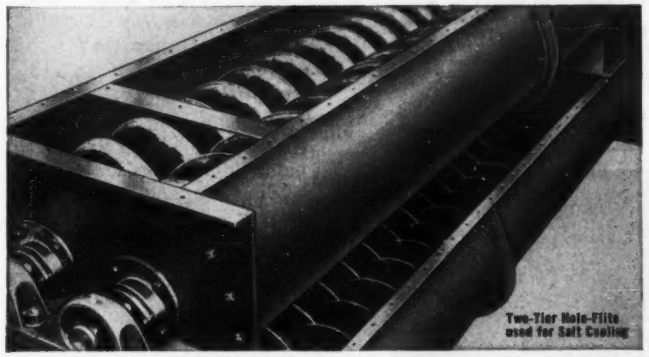
▶ Handles Pastes, Sludges or Solids!

▶ Up to 80% Saving in Space!

▶ Permits Continuous, High Efficiency Operation!



Backed by the same well-known organization that pioneered COTTRELL Precipitators, MULTICLONE Collectors and other leading products, the HOLO-FLITE Processor represents a far-reaching advancement in the science of heat-exchanger design. Widely adaptable to various types of cooling and similar applications in industrial processing operations, the HOLO-FLITE handles powdered or granular solids, moist pastes or slurries with equal facility. Moreover, it requires as little as 1/5th the space of other heat exchangers . . . causes no dust, therefore requires no costly or complicated auxiliary recovery equipment . . . and maintains its uniformly high efficiency under modern continuous-flow operations (no stop-and-go "batching" operations are necessary).



Two-Tier Holo-Flite used for Salt Cooling

Unique Simplicity

Basically, the HOLO-FLITE consists of two or more hollow intermeshing conveyor screws that slowly rotate in a trough or tube. The cooling agent circulates through the hollow flights and shafts of the conveyor screws while the product itself "flows" in the trough where it is constantly rotated into, around, over and under the moving heat-exchange surfaces. The continuous mixing, turning, folding action causes a constant change of contact with the heat-exchange surfaces and results in a high rate of heat transfer. Yet the action is so gentle that there is no dusting and little, if any, abrasion of crystalline particles.

Unlimited Capacity

HOLO-FLITE Processors can be readily adapted to virtually any capacity requirement and are in daily operation on such varied products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods, and many other products. Cooled products can be packaged directly from the HOLO-FLITE discharge, saving time, space and additional handling.

Be sure to investigate HOLO-FLITE savings before you install heat-exchange equipment. To insure maximum operating efficiency at low overall cost, each installation is individually engineered to the job using basic stock-size elements. Contact the nearest Western Precipitation office for further details on the revolutionary HOLO-FLITE Processor—or write direct!

FREE! New 8 Page Bulletin describing HOLO-FLITE features and applications will gladly be sent on request!

*Reg. T.M.

A FEW OF MANY HOLO-FLITE ADVANTAGES

WIDE ADAPTABILITY: HOLO-FLITE handles fine-grained, crystalline or powdered solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, cooled or ambient water, or other fluids to provide a wide range of processing temperatures.

SPACE-SAVING COMPACTNESS: Because of its large active heat-transfer surface per cubic foot of space required, the HOLO-FLITE requires only a minimum of space—is 5 to 6 times as compact as other equipment of comparable capacity!

LOW POWER REQUIREMENTS: HOLO-FLITE conveyor screws rotate slowly—usually only 1 to 12 r.p.m. Further, multiple tiers can be driven by one motor, assuring low power consumption.

INSTALLATION FLEXIBILITY: The basic HOLO-FLITE unit is two intermeshing screws in a single trough, but four or six screws per trough can also be installed. Moreover, any number of troughs can be "tiered" on top of one another—trough lengths can be varied from 8 to 20 ft.—screw diameters can be varied from 7" to 16"—to provide virtually any desired capacity in a minimum of space!

Write for full details on the many savings the HOLO-FLITE Processor can bring to your particular applications.

WESTERN Precipitation CORPORATION

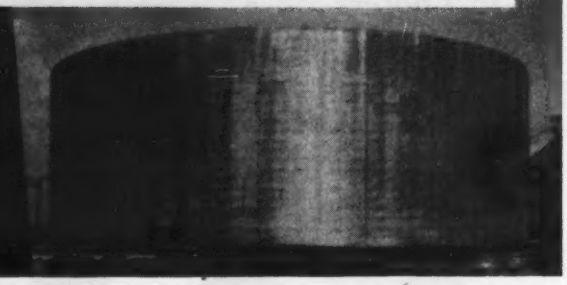
ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1023 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 N. La SALLE ST. BLDG., CHICAGO 2
1429 PEACHTREE ST. N.E., ATLANTA 5 • HOBART BLDG., SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

When inquiring check CP 2080 on handy form, pgs. 2-3

Horton Cone Roof Tanks

for High Temperature Storage of Ammonium Nitrate



The 80,000-bbl. tank illustrated above is used to store an 80 per cent solution of ammonium nitrate. It is insulated and heated to keep the contents of the tank in solution.

We fabricate and erect tanks and plate work structures of carbon steel or corrosion-resistant metals for chemical plants. We are also equipped to supply structures made of stainless clad steel, steel clad with other corrosion resistant metals or carbon steel lined with corrosion resistant metals. Further information, estimates or quotations, may be had by writing our nearest office.

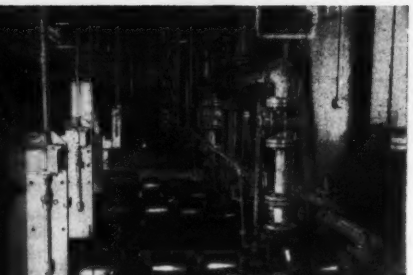
CHICAGO BRIDGE & IRON COMPANY

Atlanta 3 ..... 2107 Healey Bldg.
Birmingham 1 ... 1533 North Fiftieth St.
Boston 10 .... 1007—201 Devonshire St.
Chicago 4 ..... 2116 McCormick Bldg.
Cleveland 15 ..... 2212 Midland Bldg.
Detroit 26 ..... 1535 Lafayette Bldg.
Houston 2 ..... 2131 C & I Life Bldg.
Los Angeles 17 . 1536 General Petroleum Bldg.
New York 6 ... 3314—165 Broadway Bldg.
Philadelphia 3 . 1650—1700 Walnut St., Bldg.
Pittsburgh 19 ..... Alcoa Bldg.
San Francisco 4 ..... 1545—200 Bush St.
Seattle 1 ..... 1307 Henry Bldg.
Tulsa 3 ..... 1649 Hunt Bldg.

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

When inquiring check CP 2081 on handy form, pgs. 2-3

4 REASONS WHY SYNTHETIC RUBBER PRODUCERS CHOOSE *Nagle* PUMPS



It's a pretty good chance that the synthetic rubber used in the tires on your car, and other synthetic rubber parts, was handled by Nagle Pumps during production. Nagles have been selected for pumping latex in synthetic rubber plants for four basic reasons:

(1) Nagle Pumps create a minimum of turbulence thus minimizing coagulation because of their high efficiency. (2) Nagle Pumps are easily dismantled for cleaning, essential in this application. (3) Stuffing box is properly designed, readily accessible and shafting and bearings are heavy minimizing gland leakage. (4) Materials of construction were specially selected for this tricky application.

Design features of Nagle Pumps make them distinctly advantageous for many applications in petro-chemical plants and refineries. Six Nagle 2½" type "T," frame 95 J, pumps are shown at a Baytown, Texas synthetic rubber plant.

NAGLE PUMPS

NAGLE PUMPS, INC.
1247 CENTER AVENUE, CHICAGO HEIGHTS, ILLINOIS

PUMPS FOR ABRASIVE AND CORROSIVE APPLICATIONS

When inquiring check CP 2082 on handy form, pgs. 2-3

CONSTRUCTION

Brush attachments add to capacity of sweeper

Uses: For floor sweeping.

Features: Twenty-inch unit can be fitted with two side brush attachments to increase sweeping width to 32". So equipped, this motorless sweeper can cover as much as 20,000 square feet per hour.

Description: Left and right hand side brush attachments make possible sweeping the angle of wall and floor in either direction. Sweeper is said to provide better cleaning of rough and uneven floors while maintaining its high degree of maneuverability, with no noticeable increase in pushing effort.

(Product of Handling Devices Co., Inc., Room 252, Dept. CP, 43-45 Pearl St., Brookline 46, Mass. . . . or for more information check CP 2083 on handy form, pages 2 & 3.)

Fresh air featured in air conditioning

Air conditioning system which constantly adds fresh air throughout building—plus adding moisture in winter and removing it in summer — is described in illustrated, 8-page bulletin. A typical installation is outlined and explained in chart form.

Briefly the method is: Fresh air enters from outdoors and passes through a spray of Hygrol liquid absorbent. Air, now dried to a relatively low humidity (in summer) passes down building to cooling units. These units mix fresh air with air being recirculated on the several floors. Slight positive atmospheric pressure thus created helps exhaust fans remove stale air and smoke.

Fresh air, with the proper moisture content, is therefore present and being constantly added throughout the building no matter what the season. Simplicity and better control are said to have been attained in system by separating the air drying and air cooling functions.

Bul 121 is issued by Niagara Blower Co., Dept. CP, 405 Lexington Ave., New York 17, N. Y. When inquiring specify CP 2084 on handy form, pages 2 and 3.

Now-

83% guaranteed minimum efficiency with No. 6 oil

ANOTHER *Powermaster*® "FIRST"

Compare ASME tests on *Powermaster* with those of any other boiler. You'll see why the automatic *Powermaster* with VORIFLOW combustion is your best buy in packaged boilers. *Powermaster* efficiency actually *increases* at less than full load (which is normal field operation). Start cutting your steam costs today by getting full information on the installation, operating, and maintenance economics of *Powermaster* —15 to 500 HP units for steam generation to 250 psi, and hot water to 30 psi. ASME Code construction. Approved by Underwriters' Laboratories.

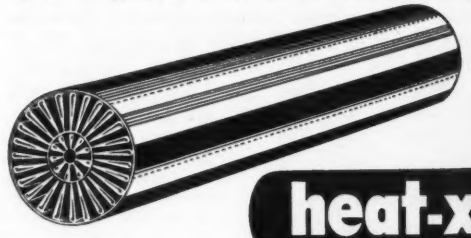
Write Now to:

ORR & SEMBOWER, INC.
960 Morgantown Road, Reading, Pa.

BUILDERS OF COST-SAVING BOILERS SINCE 1885

When inquiring check CP 2085 on handy form, pgs. 2-3

INNER-FINNED TUBING FOR HIGH CAPACITY... LOW PRESSURE DROP



heat-x

HEAT-X inner-finned tubing combines maximum heat transfer with minimum pressure drop.

Large amount of transfer surface compressed into small area provides compactness . . . saves space.

Applicable to problems involving heat transfer of nearly all liquids and gases.

Request free bulletin.

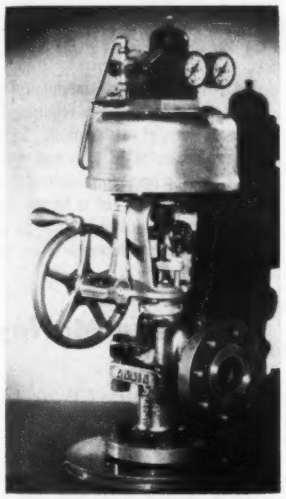
THE HEAT-X-CHANGER CO., Inc.
BREWSTER - NEW YORK

When inquiring check CP 2086 on handy form, pgs. 2-3

Advantages of motor and manual control combined in valve

Combination automatic and manual control valves, designated models 1520 SMW and 1560 SMW, utilize advantages of Domotor control unit plus versatility of handwheel operation. Handwheel mechanism was developed to provide convenient and positive supplementary control during start-up periods, or when system is shut down temporarily for instrument repair.

Major application of auxiliary manual control is in adjusting flow of steam to turbines or steam engines, fuel to engines, and when batches are being processed intermittently. Some operators use manual control when adjusting fuel consumption for arriving at maximum engine efficiency. Handwheel may also be used as an adjustable limit stop for automatic control valve plug.



Handwheel provides supplementary control

Automatic operating principle of Domotor Valve employs a sealed piston which is actuated by internal pressures, combined with a built-in null type positioner, assuring powerful and positive valve action, with positioning accuracy up to 1/1000 of valve travel. Standard series valves withstand operating pressures to 5000 psi, with special applications to 50,000 psi. Effective temperature ranges from –100°F to 450°F, the latter with Teflon packing.

(Product of The Annin Co., Dept. CP, 3500 Union Pacific Ave., Los Angeles 23, Calif. . . . or for more information check CP 2087 on handy form, pages 2 and 3.)

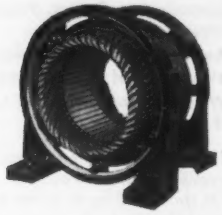
Informative file folder catalogs jacketed pipe and fittings

Information on standard line of 125# cast iron jacketed fittings, 150# steel flanged fittings, flanged jacketed steel pipe, threaded jacketed steel pipe, and jacketed blind flanges is presented in informative file folder catalog. Complete specifications and dimensional information are included. In addition, data on a line of jacketed fittings for welding is given.

General catalog on Jacketed Pipe and Fittings is issued by Red Jacket Co., Inc., Dept. CP, Investment Bldg., Pittsburgh 22, Pa. When inquiring specify CP 2088 on handy form, pages 2 and 3.

Howell Weather-Protected Motor showing frame construction of 20 h.p. sizes and larger.

Each slot cell has eight pieces of insulation; top and bottom coils and all phase groups are insulated from one another.



Entire stator is twice saturated with resin-based varnish, twice baked at high temperature for complete protection.

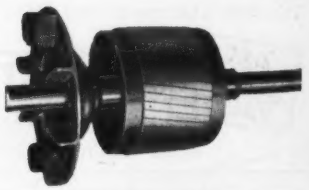
New Howell Weather-Protected Motor!

You can use it on *any* outdoor job—substitute it for *any* standard open motor of the same frame size!

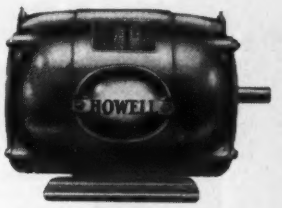
Splashing rain, drifting snow, boiling sun or wind-blown debris can't affect the long life or smooth-running performance of the new Howell Weather-Protected Motor . . . it's designed inside and out for use in *all* kinds of weather!

Except for ventilation openings, the end plates and heavy-duty frame totally enclose all working parts. Outer surface and hardware are treated to resist rust and corrosion; outer nuts and bolts have hexagonal heads for easy handling. Motor ventilation is obtained from large fans mounted on the rotor shaft which draw air through baffled, screened ventilation openings to cool both windings and stator laminations. The result is a motor ideal for use in the chemical, petroleum or air conditioning industries—anywhere dependable motor performance is required outdoors.

You can get statically and dynamically balanced Howell Weather-Proof Motors in NEMA classifications or special voltages and frequencies, horizontal or vertical mountings, from 1 to 500 h.p. at 1800 rpm; corresponding ratings at other speeds are also available. For further data, or assistance in applying Howell Weather-Protected Motors to your present jobs, call your local Howell representative or mail coupon below!



Copper-clad rotor is fused into an inseparable mass; only copper or copper alloys are used, never aluminum castings.



Frame construction of 15 h.p. Howell Weather-Protected Motors and smaller. Send coupon below for full details on all sizes.

Send Coupon Today!

HOWELL RedBand MOTORS

HOWELL MOTORS

HOWELL ELECTRIC MOTORS COMPANY, HOWELL, MICHIGAN

Precision-built motors for industry since 1915

HOWELL ELECTRIC MOTORS COMPANY
HOWELL, MICHIGAN

Gentlemen:

☐ Please send Howell Bulletin WP-1
☐ Please have Howell representative call

Name_____

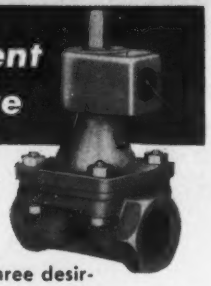
Firm_____

Address_____

City_____ Zone_____ State_____

When inquiring check CP 2089 on handy form, pgs. 2-3

Another ASCO Development
SPECIAL Bulletin 8336 Valve



Combining . . . Automatic Remote Pilot Control with the . . . Saunder's Type Diaphragm Valve

With this valve, you can bring into your flow control three desirable operating advantages:

- **You can install a non-clogging, tight-seating, corrosion and abrasion resisting, diaphragm valve suitable for corrosive liquids and gases.**
- **And at the same time obtain with it, dependable ASCO pilot control for automatic and remote closing and opening.**
- **With explosion-proof and watertight solenoid enclosures, if required.**

This valve can be installed in any position and is available normally open or normally closed. It controls flow in either direction. Wide selectivity in body and contact material provides bronze, stainless steel, cast iron, Saran and sanitary bodies, rubber or glass lined, etc. Pipe sizes: ½ to 2 inches; heights: 6 5/16 to 10 1/16"; face to face: 2 7/8 to 7".
This valve is but one of many ASCO Types, *all operating with automatic and remote control.* Write us in detail about your control problem. You'll be contacting "Electromagnetic Control Headquarters". This has been our business for close to seventy years.

If you would like a copy of our New Solenoid Valve Catalog, for your files, be sure to let us know.

ASCO Solenoid Valves

Automatic Switch Co.

379 LAKESIDE AVENUE · ORANGE, NEW JERSEY

When inquiring check CP 2090 on handy form, pgs. 2-3

for SCREENING • FILTERING • STRAINING

let MULTI-METAL help design it . . . build it!

Whether it's wire or filter cloth, filter leaves, or semi or complete processing or handling equipment, Multi-Metal offers you the long experience, research, engineering and design service and precision fabricating facilities to build just what you need.

MULTI-METAL MAKES . . .

Wire cloth of any mesh, weave and alloy; by the roll or in fabricated units of any type and size. Screens, filter leaves, strainers, sieves, discs, pads, baskets, trays, conveyor belts, semi-apparatus and complete processing equipment.

Write for Multi-Metal Catalog. It's packed with technical data and project planning. It's free.

MULTI-METAL WIRE CLOTH CO., INC.

1356 GARRISON AVENUE · NEW YORK 59, N. Y.

When inquiring check CP 2091 on handy form, pgs. 2-3

CONSTRUCTION

Masonry cutting blades are abrasive — cut like diamond

Uses: For cutting masonry materials such as concrete, tile, brick.

Features: These abrasive blades are said to cut masonry materials with speeds approaching those of diamond blades. Blades will slice through a 2 x 5" Natco Furing Tile in 11 sec . . . through fire brick in 5 sec . . . face brick in 8 sec . . . and through concrete block in 17 seconds.

Description: Wet cutting blades have been tested at speeds in excess of standard operating speeds to provide a greater margin of safety. Factory dressed cutting edge assures peak cutting efficiency. Protective blade-blotters lessen possibility of fracturing from over-tightening blade collar. Steel blade centers guard saw shaft and strengthen blade. A correct blade specification for the cutting of every known masonry material is available, according to manufacturer.

(Product of Clipper Mfg. Co., Dept. CP, Suite 619, 2800 Warwick, Kansas City 8, Mo. . . . or for more information check CP 2092 on handy Reader Service slip, pages 2 and 3.)

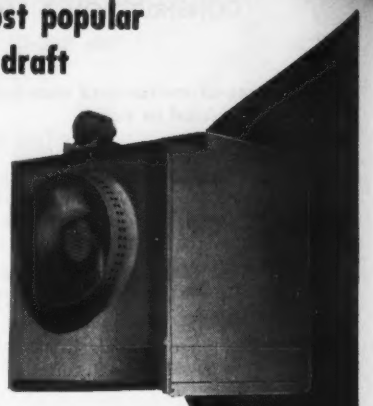
Bulletin presents facts on rubber parts

Four-page, 2-color bulletin presents facts on molded rubber parts available in a variety of shapes for many applications. Products discussed include O-rings, seals, gaskets, seats, pads, grommets, insulators, isolators, discs, cushions, mounts, shims, retainers, expanders, impellers, boots, and drive belts.

In addition to stock products, company is said to provide special formulations for resistance to temperature extremes, resistance to fluids, and resistance to atmospheric conditions. Unusual requirements including odorless and tasteless characteristics, and non-corrosive properties can also be satisfied.

Bul 5201A1 is issued by Rubber Products Div., The Parker Appliance Co., Dept. CP, 17325 Euclid Ave., Cleveland 10, Ohio. When inquiring specify CP 2093 on form, pgs. 2 & 3.

World's most popular mechanical draft COOLING TOWER...



the Marley AQUATOWER

The simple, fool-proof mechanical draft tower for any job requiring 2 to 60 tons of refrigeration. Stocked in a wide range of sizes and models in 30 cities for immediate delivery. Can be located indoors or out to fit the requirements of any commercial or residential cooling job. See your Marley Representative, or write for Bulletin AQ-53.

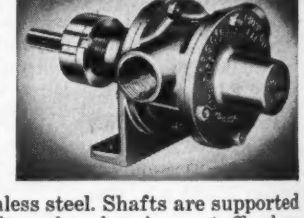
MARLEY **The Marley Company**

Kansas City, Missouri

When inquiring check CP 2094 on handy form, pgs. 2-3

JABSCO STAINLESS STEEL PUMPS SOLVE CORROSIVE PUMPING PROBLEMS

Designed and Engineered for Chemical Applications



Jabsco's complete line of self-priming, corrosion-resistant pumps answer a multitude of pumping needs. Models 2810 (1" pipe size), 2870 (½"), and 2690 (⅜") have all metallic parts of Type 316 stainless steel. Shafts are supported by oversize, replaceable carbon bearings, stuffingbox type shaft seal with chemical resistant packing. Pumps function perfectly even with dry suction lifts approaching 15', no foot valve is required. When primed, they suck as high as 26'. Jabsco pumps have no metal-to-metal contact, no gears to wear or become noisy. The exclusive "camflexed" Neoprene Impeller is the only moving part. This tough, long-lived, wear resistant impeller is self-lubricated by the liquid pumped. Jabscos are economical, low in first cost, and trouble and maintenance free, even under continuous operation. May be mounted at any angle to pump thin or viscous liquids, and can be operated efficiently at low or high speeds. At 10' head and 1750 RPM, Model 2810 delivers up to 27 GPM, Model 2870 up to 10 GPM, Model 2690 up to 4 GPM. Other stainless steel models also available with ball bearings and mechanical seals. For complete information on how Jabsco can solve your pumping problems, write **Jabsco Pump Company,** 2031 North Lincoln Street, Burbank, California.

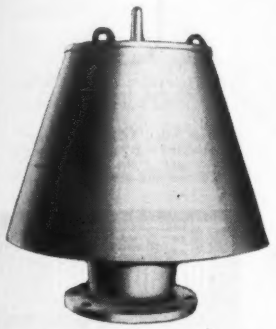
When inquiring check CP 2095 on handy form, pgs. 2-3

Vapor-tight, leak-proof valve features membrane seating

Uses: For conservation of volatile products stored in bulk tanks.

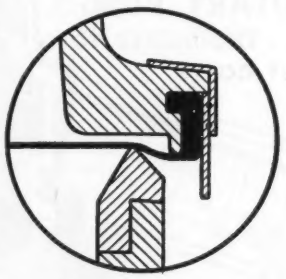
Features: Conservation valve has a vapor-tight, leak-proof membrane seating, according to manufacturer. Membranes of Buna N are stretched across both the pressure and vacuum valve pallets. Beads around the edges of membranes are snapped into grooves cut in edges of pallets, and are held tightly in place with a non-corrosive aluminum drop ring.

Description: An opening in the center of the pressure membrane permits tank pressures exerted against bottom of pressure membrane to be applied also against top of pressure membrane. Membrane is flexible. Consequently, pressure exerted from top holds membrane tightly against aluminum seating ring, forcing the membrane to adjust itself and conform to any unevenness or irregularity of seating ring, assuring tight leak-proof closure up to pressure at which valve is set to open.



Conservation valve for volatile products

Similarly, openings spaced around vacuum membrane permit atmospheric pressures applied against bottom of vacuum membrane to be applied also against the top of the membrane, assuring tight closure up to vacuum at which valve is set to open.

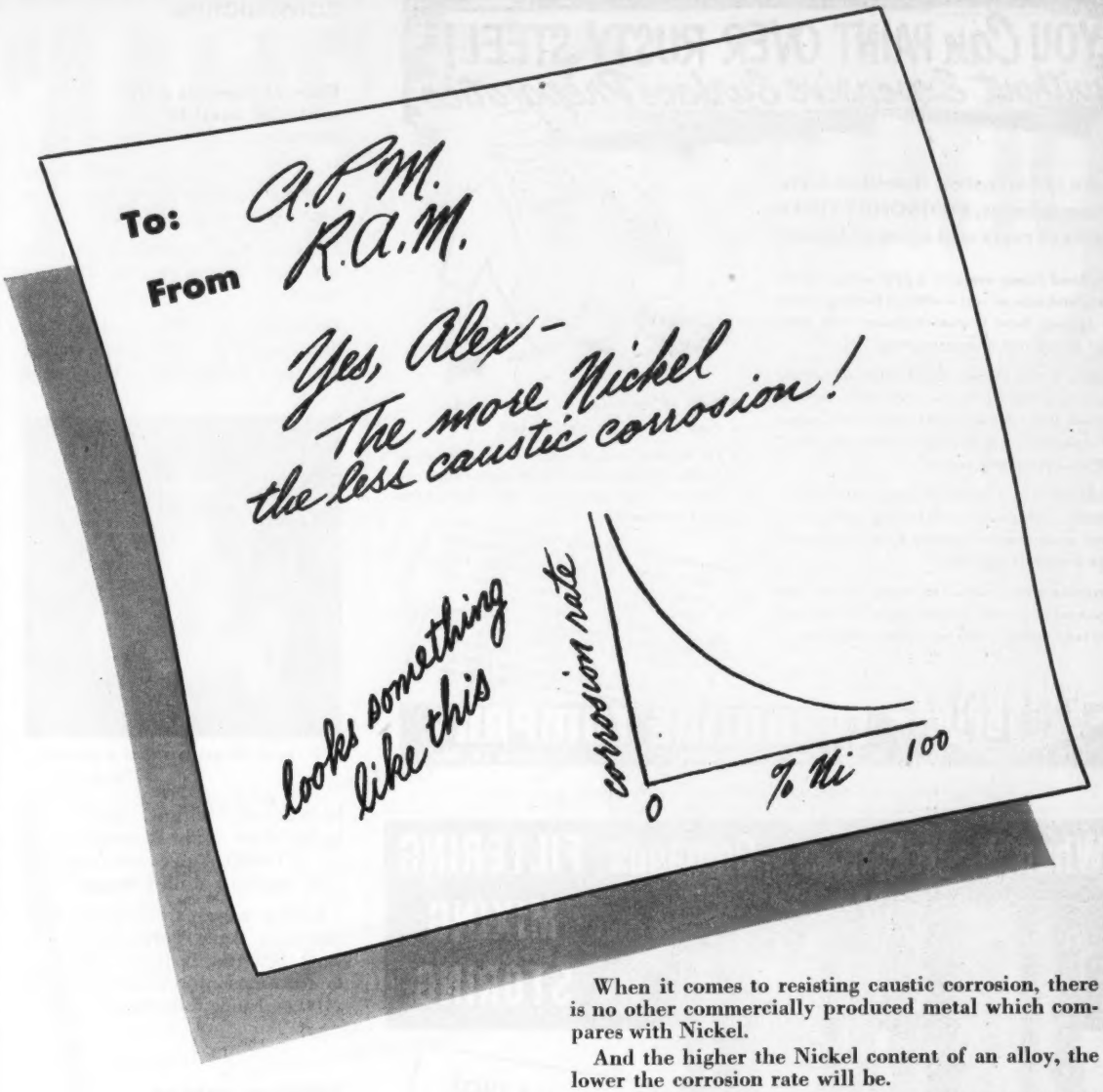


Membrane held in place with aluminum drop ring

"Pressure balanced" construction is said to assure a more positive, leak-proof closure. Effect is secured simply with tank and atmospheric pressures. No padding or backup material is needed or used in the unit.

Manufacturer reports that valves are non-freezing; that they have close correlation between opening and closing pressures; and that valves require only infrequent inspection and a minimum amount of maintenance.

(V-130 Hi-Flo Vapor-Tite Membrane Seating conservation regulator is a product of The Johnston and Jennings Co., division of Pettibone Mulliken Corp., Dept. CP, 6917 Bessemer Ave., Cleveland 27, Ohio . . . or for more information check CP 2096 on handy Reader Service slip between pages two and three.)



When it comes to resisting caustic corrosion, there is no other commercially produced metal which compares with Nickel.

And the higher the Nickel content of an alloy, the lower the corrosion rate will be.

That's why, when you consider caustics you should consider Nickel and the Inco Nickel Alloys.

Inco Nickel Alloys are produced in mill forms and as Lukens Clad Steel.

Of course, there is no one metal or alloy which solves all caustic corrosion problems. That's why it will pay you to consult Inco's Corrosion Engineering Section when you want a specific solution to your problem. They have a wealth of information and will be glad to advise you.

It is advisable to place equipment orders with your supplier well in advance of scheduled use. Distributors of Inco Nickel Alloys can supply the latest information on availability from warehouse and mill. The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.

INCO TRADE MARK

Inco Nickel Alloys

MONEL® • "R"® MONEL • "K"® MONEL • "KR"® MONEL
"S"® MONEL • INCONEL® • INCONEL "X"® • INCONEL "W"® • INCOLOY®
NIMONICS® • NICKEL • LOW CARBON NICKEL • DURANICKEL®

When inquiring check CP 2097 on handy form, pgs. 2-3

YOU Can PAINT OVER RUSTY STEEL! without Expensive Surface Preparation

Even in Corrosive, Humid or Dirty Atmospheres, RUSTBOND PRIMER sticks to rusty and corroded steel.

Rustbond Primer **contains a new vehicle which wets and acts on rust—without forming water or oxygen. Bond to steel increases with time. Part of the rust disappears, too.**

Rustbond Primer **coats sharp edges as heavily as it does flat surfaces—often more heavily. Failure of finish paint films on the sharp edges of structural steel is reduced from the usual 72% to practically zero.**

Rustbond Primer **itself has good corrosion resistance. Stops most undercoating corrosion on steel when steel is exposed by physical damage or skips in topcoat.**

Rustbond Primer **is easy to apply. Just stir and brush on like paint. Costs no more than a good red lead primer. Only one coat is required.**

- **Take off loose rust by wirebrushing**
- **Coat with RUSTBOND PRIMER**
- **Put on two coats of your corrosion resisting finish—the one which is otherwise satisfactory for your conditions. No intermediate coat necessary.**

Vinyls won't peel from wirebrushed rusty surfaces when used with Rustbond Primer. With other primers, the steel must be sandblasted.

Bulletin 150 describes some rigid tests made of Rustbond Primer by the country's largest chemical plants.

CARBOLINE COATINGS • CEMENTS • FINISHES

CARBOLINE COMPANY
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When inquiring check CP 2098 on handy form, pgs. 2-3

When Your Process Demands FILTERING MIXING STORING

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- PROVED, LOW-COST OPERATION
- EASY TO CLEAN
- DEPENDABLE, TROUBLE-FREE PERFORMANCE
- ALL SIZES AND CAPACITIES
- LOW UPKEEP

Regardless of the size or type of your installation, whatever your process may be, there's an Alsop Filter, Mixer and Storage and Mixing Tank to "fit your Job", you can be sure of getting from Alsop the right unit properly applied — you can depend on Alsop proved performance features. Alsop Filters, Mixers and Tanks are available in a complete range of sizes and capacities and Alsop Equipment is custom fitted to your application by engineers who have thorough experience in Filtration and Agitation. Look for the proved features and the benefits that Alsop Filters, Mixers and Tanks can bring to your processing operations. Write for full information, recommendations and quotations.

ALSOP
ENGINEERING CORPORATION
806 Alsop Square, Millidale, Connecticut

When inquiring check CP 2099 on handy form, pgs. 2-3

CONSTRUCTION

Polyethylene is only material used in valves

Uses: For incorporation into existing installations or for use in new pipe line assemblies.

Features: Polyethylene is only material used in 1 and 2" bore valves.

Description: These valves are light in weight (2" valve weighs less than 6 pounds). They resist

2" valve weighs less than 6 pounds

hydrofluoric, sulfuric, nitric, and hydrochloric acids at temperatures up to 160°F. Valves are furnished with standard drilled flanges.

(Agilene valves are a product of American Agile Corp., Dept. CP, P. O. Box 168, Bedford, Ohio. . . . or for more information check CP 2100 on handy form, pages 2 & 3.)

Tabulates data on boiler tubing

Data card is designed to help individuals involved in the purchase of welded carbon steel boiler tubing or estimation of equipment using this material.

Card tabulates present-day prices per hundred feet of electric-resistance-welded boiler tubing in various quantity brackets. Seventy-seven popular sizes are shown in the table. Also included are weights per foot and footage required by each particular size to reach a given quantity bracket.

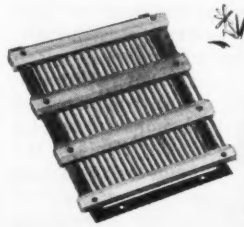
Data Card TDC-137A is issued by The Babcock and Wilcox Co., Tubular Products Div., Dept. CP, Alliance, Ohio. When inquiring specify CP 2101 on handy form, pages 2 and 3.

Yes! They Are Related!

Much of the better-grade rubber garden hose used today is made by a process employing equipment heated by

"FOLDED-and-FORMED" Heating Elements

This is typical of the extremely wide range of applications in which these TRENT patented electric heating elements are proving their unequalled efficiency and economy. Made in Standard or Custombuilt Racks, to provide any required K. W.



What is YOUR heating problem? It will pay you to get the complete "Folded-and-Formed" story.

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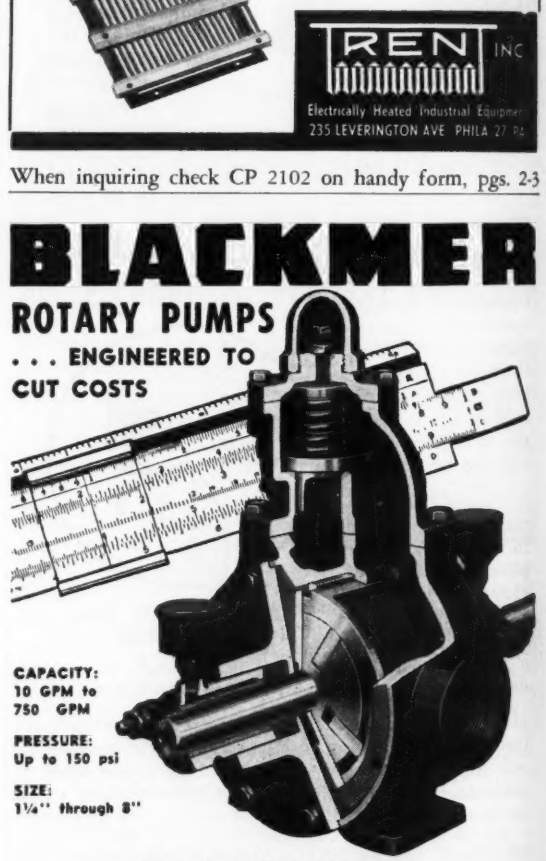
Electrically Heated Industrial Equipment
235 LEVERINGTON AVE PHILA 27 Pa.

When inquiring check CP 2102 on handy form, pgs. 2-3

BLACKMER ROTARY PUMPS . . . ENGINEERED TO CUT COSTS



CAPACITY: 10 GPM to 750 GPM

PRESSURE: Up to 150 psi

SIZE: 1¼" through 8"

Write for Bulletin 307 to get "FACTS ABOUT ROTARY PUMPS"

BLACKMER LIQUID MATERIALS HANDLING

BLACKMER PUMP COMPANY • GRAND RAPIDS, MICH.

When inquiring check CP 2103 on handy form, pgs. 2-3

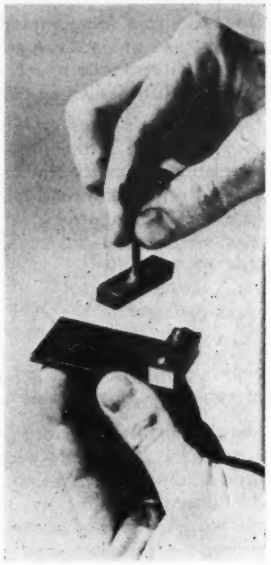
Industrial truck battery repair facilitated by use of simple steel mold . . .

inter-cell connectors can be easily spliced

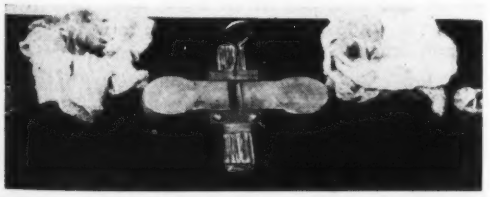
Uses: To permit simple reconstruction of battery inter-cell connectors which have been sawed for cell removal and repair.

Features: On the job splicing of connectors is facilitated by use of a simple steel mold consisting of a plate with two side blocks — one fixed and the other movable. Battery's power is used for lead fusion.

Description: After inter-cell connectors have been sawed, battery elements removed for repair and repair cell placed in its rubber jar, splicing mold permits simple reconstruction of sawed connector in its original form. Before it is placed under connector to be spliced, two sawed ends of connector are chamfered to provide puddling space. Mold is then supported from both sides by small wedges. Wood chips are satisfactory. Movable block of mold is next brought into contact with connector. It is then possible to use lead-burning electrode to make weld in exact shape and form of original connector. Tip of carbon electrode is touched to that side of connector which is in the electrical circuit and held in



Mold consists of a simple plate with two side blocks — one fixed and the other movable

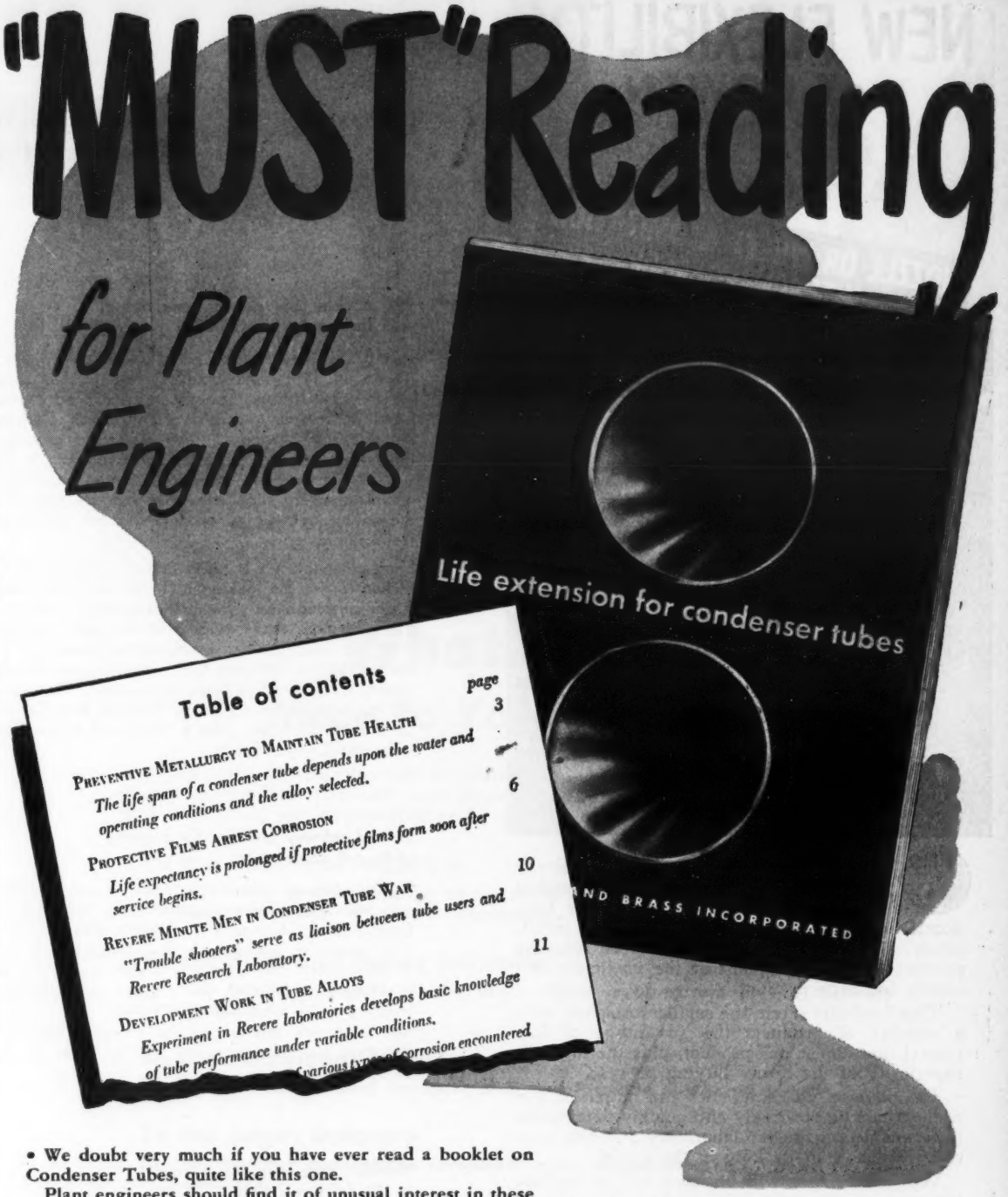


Before mold is placed under connector to be spliced, sawed ends of connector are chamfered to provide puddling space

that position until it is cherry red. Lead is then added and the tip of the carbon electrode moved slowly through puddle of molten lead to build the weld from the bottom up.

(Splicing mold is a product of Gould-National Batteries, Inc., Dept. CP, Stone and Calhoun St., Trenton 7, N.J. . . . or for more information check CP 2104 on handy form, pages 2 and 3.)

"MUST" Reading for Plant Engineers


Life extension for condenser tubes
AND BRASS INCORPORATED
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PREVENTIVE METALLURGY TO MAINTAIN TUBE HEALTH
The life span of a condenser tube depends upon the water and operating conditions and the alloy selected. 6
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Life expectancy is prolonged if protective films form soon after service begins. 10
REVERE MINUTE MEN IN CONDENSER TUBE WAR
"Trouble shooters" serve as liaison between tube users and Revere Research Laboratory. 11
DEVELOPMENT WORK IN TUBE ALLOYS
Experiment in Revere laboratories develops basic knowledge of tube performance under variable conditions.
various types of corrosion encountered

• We doubt very much if you have ever read a booklet on Condenser Tubes, quite like this one.

Plant engineers should find it of unusual interest in these times when it is more important than ever that every last ounce of use be squeezed out of the condenser tubes in their plants.

This 28-page booklet includes data on various copper alloys, photos of cut-away tube sections showing various types of corrosion encountered in condenser tube service and photomicrographs showing the grain structure of different kinds of metals under varying operating conditions.

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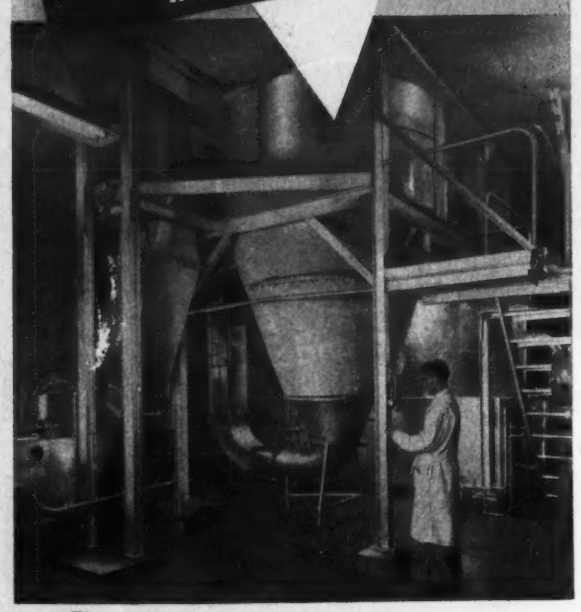
When inquiring check CP 2105 on handy form, pgs. 2-3

NEW FLEXIBILITY of BOWEN SPRAY DRYERS

NOZZLE OR WHEEL ATOMIZATION INTERCHANGEABLE



Now, for the first time, Bowen Spray Drying installations have the widest possible application. The use of both nozzle and wheel atomization in the same installation allows the drying of widely varying products in a single plant at the maximum efficiency for each product.

This flexibility offers the smaller company with a number of products the advantage of low capital investment per product, plus the inherent superiority of the Spray Drying process.

The physical characteristics and output of any product can be positively and quickly determined by a simple run in our laboratory . . . the most comprehensive of its kind in the world.

We believe you will be interested in reading our new easy-to-understand booklet "The Bowen Story of Spray Drying." Send for your free copy

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When inquiring specify CP 2106 on handy form, pgs. 2-3

Expanding Chemical Production

Will double U.S. polyethylene output with three new plants in '55

Three new polyethylene plants, which when completed in 1955, will double present U.S. polyethylene production, have been announced by the Bakelite Company, a division of Union Carbide and Carbon Company. The expansion program, believed to be the largest ever undertaken in the plastics industry, will bring total annual production of the company's polyethylene to more than 250 million lb, as well as producing other chemicals from natural gas.

Each plant, having a rated annual capacity of 60 million lb, will be located in Texas and Calif. near major gas supplies. The first will begin operation at Texas City, about August of this year; by mid-1954 the Seadrift, Tex. plant will be open, and by early 1955 the Torrance, Calif. plant in Los Angeles county is expected to begin production. The plants will be built and operated by Carbide and Carbon Chemicals Company, also a divsion of Union Carbide and Carbon Corp.

Expand refinery facilities for naphtha units, cat cracking

Construction of additional boiler house facilities and auxiliaries is being undertaken by the Pure Oil Company of Chicago at its Toledo, Ohio refinery. This expansion, expected to be completed in July of this year, is in connection with new catalytic cracking facilities and new copper oxide naphtha treating units also being installed. The various new units are the nucleus of a major expansion program being undertaken by the firm at the Toledo refinery.

Pennsalt expansion sets record in '52 for firm's history

Expansion of production facilities during 1952 and the acquisition of Sharples Chemicals, Inc. early in the year have given the Pennsylvania Salt Mfg. Co. of Philadelphia a broader base than it has ever had before, it was disclosed by the company's president in a recent report to the share owners of the company.

During 1952, the report showed, $7.28 million was spent on expansion — an unprecedented amount for any previous single year. This included expenses on a new $8 million chlorine, caustic soda and anhydrous hydrogen chloride plant at Calvert City, Ky., due for completion within the next few months, and on facilities to more than double production of synthetic ammonia at Wyandotte, Mich. also due for early completion.

The company's sales in 1952 exceeded $57 million — the highest in the firm's history — and 21 per cent above sales for the previous year. Net earnings after federal and state income taxes were $3,217,942, compared to $3,542,309 in the previous year — this is a dip of $324,367, despite the increased sales.

Shawinigan sets sights on expansion of resins by 35 per cent

Shawinigan Resins Corp., Springfield, Mass. has announced its fourth expansion (in its ten year production of vinyl resins) is expected to increase its current capacity by 35 per cent when completed. Largest of three manufacturers of these resins, the firm is owned and operated jointly by Shawinigan Products Corporation and Monsanto Chemical Company.

New England location chosen for synthetic resins

Reichhold Chemicals, Inc., has set up a manufacturing division at Ballardvale, Mass. for production of an extensive line of synthetic resins and basic industrial chemicals used by the regions textile, paper, foundry, paint, and plastic industries.

The firm's expansion was initially begun late last year when RCI founder and board chairman, Henry H. Reichhold, personally acquired a substantial interest in Watson-Park Co. of Ballardvale and which has a formaldehyde production capacity of 25 million lb annually. Watson-Park retains its own identity, however.

More chemicals, rubber, plastics planned by tire company

As part of an overall expansion program, General Tire and Rubber Company officials have approved: 1) the building of a multi-million dollar chemical plant near Ashtabula, Ohio; 2) broadening of the firm's foam rubber operations at Logansport, Ind.;

3) opening of a rigid plastics division at Marion, Ind.; and 4) sale of General's stock interest in the Mansfield Tire and Rubber Company.

The chemical facility, the firm's second, will include a polyvinyl chloride resin plant and pilot plant on a 50-acre tract. Estimated cost of the project, will be approximately $6 million.

The foam rubber operation is expected to be in full production by midsummer.

Open new storage battery plant, project cost $3 million

Gould-National Batteries, Inc., has opened its new $3 million plant at Kankakee, Ill. for manufacture of industrial and automotive storage batteries.

New petrochemical plant in Texas now in full production

First unit of the Williams Plant of Koppers Company, Inc., at Port Arthur, Texas, has begun full production of ethylbenzene, it is announced. The product is shipped to Kopper's Kobuta plant near Monaca, Pa. for use as styrene monomer in production of synthetic rubber and other resins for polystyrene plastics.

Set '55 goal for polyethylene plant with 45 million lb annual output

Plans for construction of a polyethylene manufacturing plant near Orange, Texas, and capable of producing approximately 45 million lb yearly, have been announced by the Spencer Chemical Company, Kansas City, Mo. Located on a 400-acre site, the new plant is expected to get into production by the spring of 1955.

The company also announced that a contract has been concluded with Imperial Chemical Industries, Ltd. of London, holder of the basic patents on the polyethylene process.

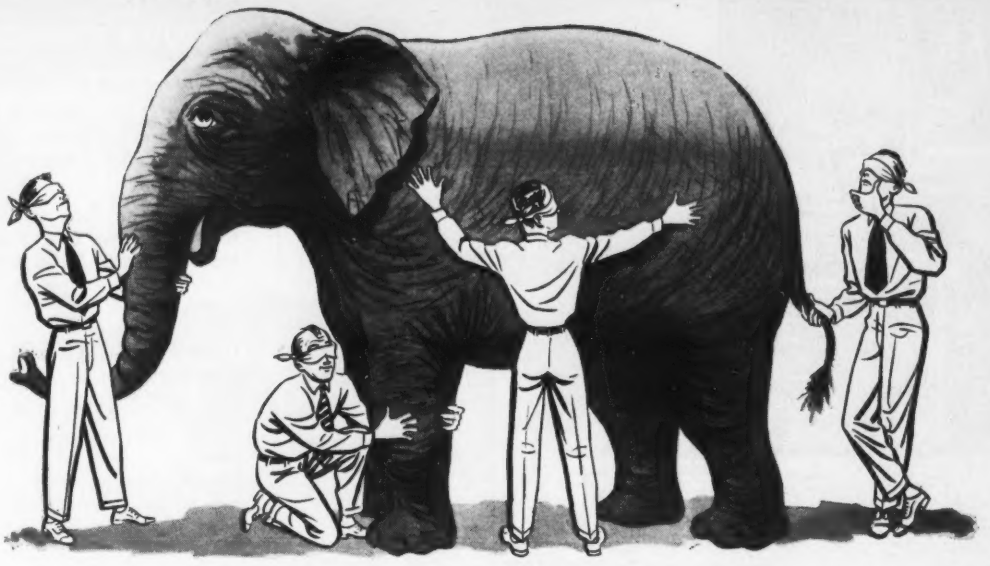
Manufacturer doubles capacity for textile fiber glass

Orders have been placed for machinery and equipment to double the textile fiber glass capacity of the Fiber Glass Division of Libbey-Owens-Ford Glass company's plant at Parkersburg, W. Va. The expansion program will require a year to complete.

Dow enters field of polyethylenes, Texas is site of initial step

Dow Chemical Co. of Midland, Mich. is entering the production of polyethylene, it has been an-

(Continued on next page)



Remember the Aesop fable where four blind men each felt a part of an elephant and decided differently as to what it was? The moral of this fable is—you need to have ALL the facts before you know the WHOLE story.

What Does GB Mean to Your Industry

We at Goslin-Birmingham frequently find that a customer in a given industry is familiar with only one phase of our activities and does not realize how diversified our engineering and plant facilities really are.

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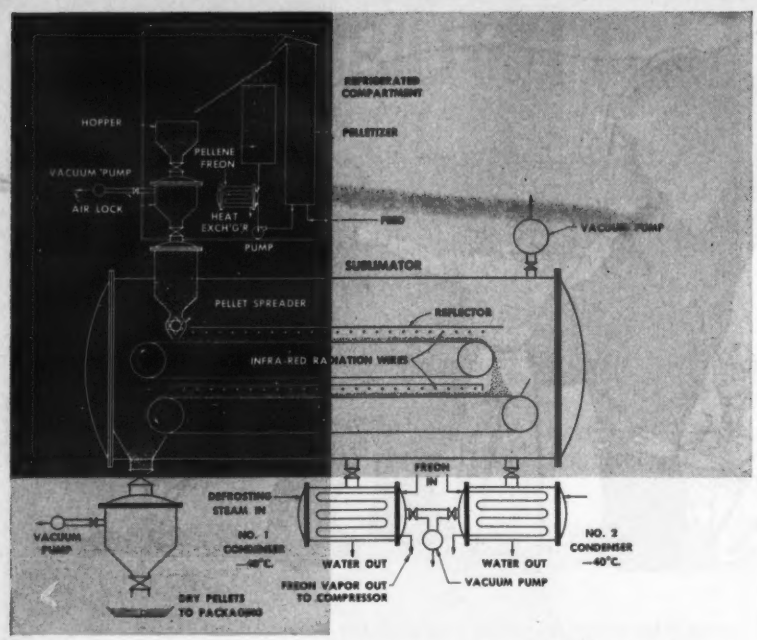
When inquiring specify CP 2107 on handy form, pgs. 2-3



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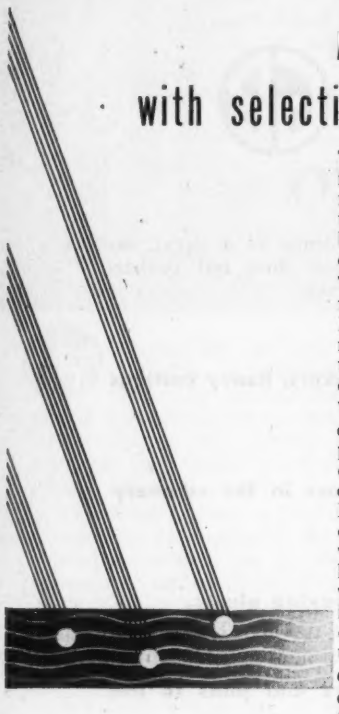
with selective absorption heating



Thanks to Proctor engineering no longer need you think of vacuum-radiant heat freeze-drying as a batch operation. All of the advantages, so thoroughly proven in batch processing are now available in a continuous system.

The fundamental principle of the system is the same as that employed in batch drying. Infra-red radiation in the range of 2 to 9 microns is used to sublime moisture from the frozen product—leaving it unchanged chemically or biologically.

With the continuous system, a pelletizer is employed to freeze the product into uniform pellets which are subsequently deposited onto a continuous conveyor. Beneath the conveyor are the infra-red radiation wires. Ice in the pellets absorbs the radiation in depth, not merely on the surface. Drying with radiant energy in this efficient wavelength range* is much more rapid than with conduction heating. In one instance, drying capacity for an organic dye was increased by 74% due to penetrating radiation.

Continuous freeze-drying with radiant energy opens up tremendous possibilities for a host of products which must be dried in quantity—and still retain potency or natural flavor.

Perhaps your product lends itself to such operation. We'll be glad to study it with you and make recommendations.

Write Today *U.S. Patent 2,445,120

Proctor & Schwartz, Inc.

633 Tabor Road, Philadelphia 20, Pa.

When inquiring check CP 2108 on handy form, pgs. 2-3

EXPANDING PRODUCTION

(Continued from preceding page)

nounced. The company's Texas Division, at Freeport, Texas, will construct plant facilities and expects to start production of the plastic in 18 to 24 months.

Negotiations for patent licenses and technical knowledge have been made with Imperial Chemical Industries Ltd., British firm.

Davison opens $7 million cat plant with 45-million lb annually

Davison Chemical Company has recently opened its $7 million catalyst producing plant at Lake Charles, La., capable of producing 45 million lb of catalyst annually. The petroleum cracking catalysts are of the synthetic fluid-type. The unit's annual capacity is sufficient to process 200-million barrels of petroleum, under average conditions. Sodium silicate is also being produced.

New manganese dioxide unit starts production

American Metallics Chemicals Corp. has started production of electrolytic manganese dioxide at its Portland, Ore. plant and is installing additional facilities for production of other products as well.

More rayon staple on the way — 50 million lb annually

Courtaulds (Alabama) Inc. has recently opened a new rayon plant at LeMoyne, Ala. which will have a capacity of 50 million lb annually of viscose rayon staple fiber. The new plant, located on a 550-acre site twenty miles north of Mobile, is expected to reach full production within two months.

Liquid resin for paper industry becomes more abundant

In a move to furnish a larger supply to Southern paper industry, American Cyanamid Co. is now producing Parez Resin 614 at its Charlotte, N. C. plant, it is reported.

The resin is a liquid cationic urea-formaldehyde resin used to impart wet-strength and dry-strength qualities to paper products.

The company has also begun producing URAC 180 resin adhesive for hot and cold pressing of plywoods, lumber care gluing, and for high frequency bonding.

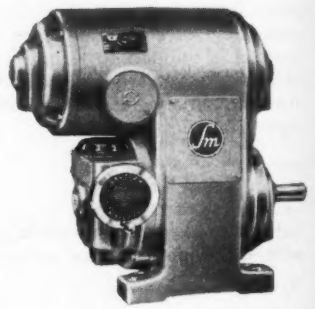
Vinyl plastisol firm moves to larger quarters

Elastomer Chemical Corp. of Nutley, N. J. has moved to larger premises at 212 Wright St., New-

How One Speed-Trol Leads to Another

Mr. J. H. Kirby, Vice President of The Humko Co., writes: In processing vegetable oil and shortening we must drive our batch mixers at various speeds ... a Speed-Trol was installed for this purpose ... we were so well pleased with its performance that we installed Speed-Trols on ALL of our vegetable oil batch mixers ... Speed-Trols give the exact speed regulation needed for vegetable oil processing.

STERLING SPEED-TROL



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When inquiring check CP 2109 on handy form, pgs. 2 - 3.

ark 5, N. J. Expanded facilities at the new plant will enable the firm to continue research and development of new products from its special vinyl plastisol compounds as well as improving existing products of the firm.

Increase ammonia production from 120 to 180 tons daily

Mississippi Chemical Corp., Yazoo City, Miss., is increasing the capacity of its ammonia plant from 120 to 180 tons per day. Work on the new project, an investment of more than $2 million, is expected to be completed late this year. The firm's original ammonia plant and other facilities went on stream in 1951.

Farm, pharmaceutical chemicals unit grows additional 12,000 sq ft

A 12,000 sq ft addition has been constructed to the Leland, Miss. factory of Geigy Company, Inc., manfacturer of pharmaceuticals, insecticides, agricultural chemicals and dyestuffs.

More fluorine chemicals for plastics slated from new plant

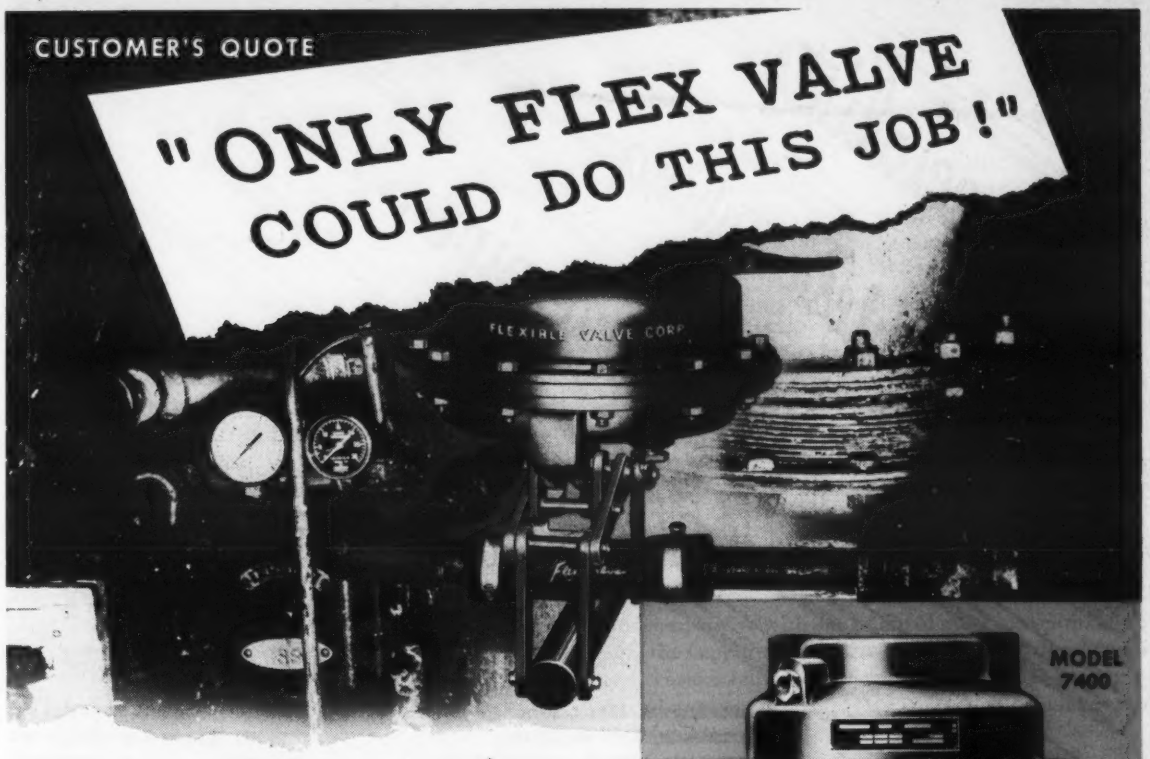
Included in two major additions to the Baton Rouge, La. works of the General Chemical Div., Allied Chemical & Dye Corp., will be a new plant for production of trifluorochloroethylene, organic fluorine chemical used by the plastics industry. The firm also plans a new sulfuric acid plant in the same locality and this unit is scheduled for completion and in operation by the end of this year.

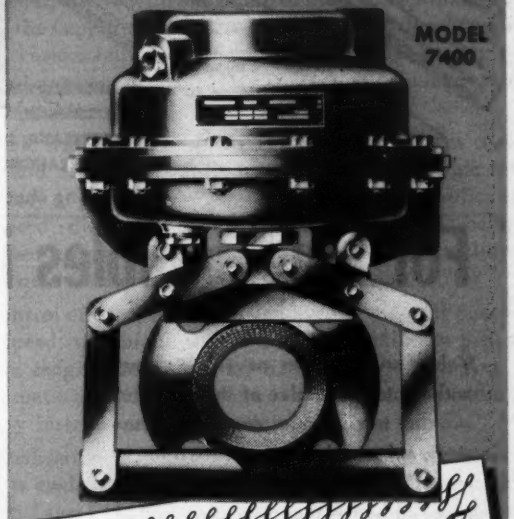
Canadian output of isopropyl alcohol gets its first start

Canada's first isopropyl alcohol production has begun at Montreal East by Shell Oil Company, Ltd. The new chemical plant has an annual capacity of 20 million lb of isopropyl alcohol and acetone. The acetone is the first to be manufactured in Canada from petroleum raw materials. Special features of the plant permit operation at –20°F.

Expanding nitrogen research, engineering facilities

Construction has begun on a million dollar expansion of the research and engineering facilities of the Nitrogen Division, Allied Chemical & Dye Corp., Hopewell, Va. Completion is scheduled for May of this year. Research will be conducted in products and processes in nitrogen and related fields, and in the fields of petroleum and natural gas chemicals.





This diaphragm motor-operated Farris Flex Valve is handling a hard-to-convey, semi-solid slurry in a leading chemical processing plant. Before it was installed, other types of valves clogged after as little as a few hours' service. *Yet Flex Valve has performed perfectly for more than 3 years, in a 24-hour, 7-day-week operation.* Many other Flex Valve installations have been giving trouble-free, continuous service for 15 years or more. If you have a problem in controlling flow of any hard-to-handle fluid, send for Catalog No. FL 382. B

Exclusive FLEX VALVE Features (Pat'd & Pat. Pending)

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When inquiring check CP 2110 on handy form, pgs. 2-3

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For true samples in the process industries

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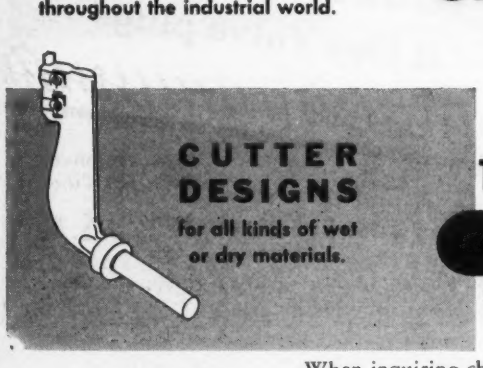

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When inquiring check CP 2112 on handy form, pgs. 2-3

New

Mass spectrometer incorporates isotope-ratio recorder

While its primary function is to provide accurate quantitative analyses of gases and light liquids within a moderate mass range, versatile spectrometer also can function as an isotope-ratio recording mass spectrometer. It can be used for the direct and precise measurement of the ratio of abundances of stable isotopes in samples of gas and water.

Informative, 7-page bulletin contains detailed information regarding performance characteristics, features, construction and uses of the instrument. Handy chart shows characteristic spectrum which can be obtained when using instrument.

Bul 1821 is issued by Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. When inquiring specify CP 2113 on handy form, pages 2 and 3.

Improve design of high-speed casers, labelers

Production advantages offered by high-speed case packers and continuous labelers for cans are described in two bulletins. One 4-page bulletin contains photographs and specifications for both single layer and double layer case packers. Second 4-page bulletin emphasizes continuous operation of labeler, featuring dual label feed, which permits uninterrupted service throughout operating period.

Copies of caser bul (Models PCD, PCS) and labeler bul (Model AUS) are available from Burt Machine Company, Dept. CP, Oliver & Barclay St., Baltimore 2, Md. When inquiring specify CP 2114 on handy form, pages 2 and 3.

Bulletin reviews advantages of nickel-coating processes

Two special-purpose methods of nickel coating, which are not competitive with each other nor with electroplating, are described in 4-page bulletin. Relative advantages and limitations of each process are discussed. One process deposits nickel during an immersion cycle by means of electrochemical displacement, while the other process functions by virtue of chemical reduction.

Operation of processes, nature of deposits, physical properties, protective value, efficiency and potential applications are discussed. Proper conditions for efficient coating are featured.

Bul EZ-92/36 is issued by The International Nickel Company, Inc., Dept. CP, 67 Wall St., New York 5, N. Y. When inquiring specify CP 2115 on convenient Reader Service slip between pages two and three.

Literature

Information on fluorescent-mercury and mercury lamps

Twenty-five-page booklet includes information on both fluorescent-mercury and straight mercury type lamps. Besides giving general mercury lamp application information and performance data for all types and sizes, booklet includes primary discussions about lamp and lumen maintenance, lamp temperature, and ambient temperature. Compact table gives standard information on all sizes and types of mercury lamps available.

Booklet A-5112 is available from Westinghouse Electric Corp., Lamp Div., Dept. CP, MacArthur Ave., Bloomfield, N. J. When inquiring specify CP 2116 on handy form, pages 2 and 3.

Claims re-roofing costs cut by cold-process method

Four-page bulletin describes simple, cold-process method which is said to cut re-roofing costs in half and provide a roof life equal to commercial hot-mop job. Cold process needs no special equipment and eliminates fire hazard in application. It provides improved adhesion and retains its elasticity indefinitely.

On test roofs, both one and two ply, torn up after more than five years of use and exposure to weather, it was difficult to separate felt layers and the liquid coating still retained its original "life", according to manufacturer. Booklet gives simple step-by-step details on how to prepare roof and complete re-roofing without skilled labor.

Booklet "Tropical Cold-Process Roofs" is issued by The Tropical Paint and Oil Co., Dept. CP, 1210-52 W. 70th St., Cleveland 2, Ohio. When inquiring specify CP 2117 on handy form, pages 2 and 3.

Wide variety of applications for air-cooled heat exchangers

Wide variety of industrial cooling and condensing applications for air-cooled heat exchangers is described in 12-page, illustrated bulletin. Known as Fin-Fan heat exchangers, units described are of forced draft type and are designed to cool liquids or gases at pressures up to 5000 psi and temperatures as high as 1500°F. Air-cooled units may be installed to replace or augment water-cooled heat exchangers.

Bul FF-FD-0.001 is issued by Fluor Corp., Ltd., Dept. CP, 2500 S. Atlantic Blvd., Los Angeles 22, Calif. When inquiring specify CP 2118 on handy form, pages 2 and 3.

THESE FLUIDS ARE DIFFICULT TO PUMP

ACETALDEHYDE
ACETONE
FORMALDEHYDE
FREON
MERCAPTANS
MERCURY
MOLTEN METALS
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NITRIC ACID
PHOSPHORIC ACID
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TRINITROCHLOROBENZENE
VINYLIDENE CHLORIDE
CHLOROSULFONIC ACID
CHROMIC ACID
HYDROBROMIC ACID
NITRIC ACID
OLEUM
OXALIC ACID
PROPIONIC ACID
SULFURIC ACID
IODINE
BENZOLCHLORIDE
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LIQUID BROMINE
CHLORACETIC ACID
DILUTE ACIDS
ALUMINUM SULFATE
DIATOMACEOUS EARTH SLURRY
FERRIC SULFATE
SODIUM HYPOCHLORITE
SALT SOLUTIONS
SODIUM SILICOFLUORIDE
HYDROGEN PEROXIDE
HYDROCHLORIC ACID
BROMINE TRIFLUORIDE
CHLORINE
CHLORINE TRIFLUORIDE
FLUORINE GAS
HYDROFLUORIC ACID
HYDROGEN CYANIDE
HYDROGEN FLUORIDE
FLUORINE
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Lapp

PULSAFEEDER

PISTON-DIAPHRAGM CONTROLLED-VOLUME CHEMICAL PUMP

Not competitive with any pump of more conventional design, the Lapp PULSAFEEDER is a highly specialized, precision, custom-built machine suited to a wide variety of special applications involving controlled-volume pumping of fluids.

Basic feature of Lapp PULSAFEEDER design is its combination of reciprocating piston action (to provide the accuracy of positive displacement) with an hydraulically balanced diaphragm which isolates material being pumped from working pump parts—and, of course, eliminates need for stuffing box or running seal.

Control of pumping rate is achieved at constant pumping speed; variable flow results from variation in piston stroke length—adjustable by hand-wheel, or, in Auto-Pneumatic models, by instrument air pressure responding to any instrument-measureable processing variable.

Justification for this specialized premium construction is evident in the many, and varied, applications in which Lapp PULSAFEEDER alone is able to perform satisfactorily. In fact, the economies of continuous processing, automatic proportioning, feeding and filling in many operations are possible only because of the unusual characteristics and peculiar advantages of Lapp PULSAFEEDER.

In general, use of the Lapp PULSAFEEDER is indicated for continuous (or intermittent) pumping, at accurately controlled volume, of fluids which cannot be satisfactorily exposed to conventional pistons, cylinders and stuffing box packing—because of the corrosive action of chemicals being handled and/or need for protection of product against contamination.

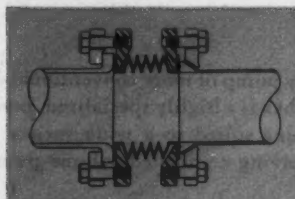
Lapp Bulletin 300 shows typical applications and flow charts. It describes and lists specifications of models over a wide range of capacities and special constructions. Also included is an Inquiry Data Sheet, from which we can make specific engineering recommendations for your processing requirement. For your copy write Lapp Insulator Co., Inc., Process Equipment Div., 100 Wilson St., Le Roy, N.Y.

When inquiring check CP 2119 on handy form, pgs. 2-3

CHEMISEAL GASKETS

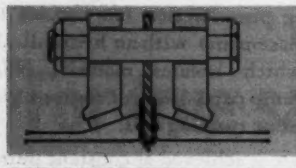
AND ACCESSORIES FOR GLASS PIPE

IMPERVIOUS TO ACIDS, CAUSTICS, SOLVENTS

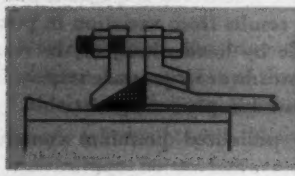


(Above:) Chemiseal Snap-on Gaskets, No. 820. Molded to match contour of conical-end glass pipe, they center automatically. For all standard pipe sizes from ¼ in. to 6 in.

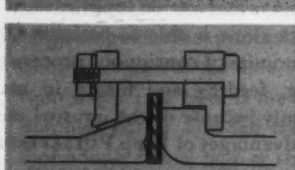
(At left:) Chemiseal Expansion Joints, No. 212 for use where thermal expansion, vibration or misalignment requires flexible pipe section. Sizes 1 to 12 in. I.P.S.



Chemiseal Teflon-jacketed, neoprene or compressed cork Gaskets, Types T6N or T6-300 are standard for Corning conical flanges, seal at unusually low bolt load.



Chemiseal Jacketed Slip-Joint Gaskets (Teflon Jacketed Neoprene) provide positive, chemical-proof seals with low bolt loads. Made for standard pipe sizes from 1 in. to 6 in.



Chemiseal Adaptors No. 2-CRS, provide a tight, safe seal between glass coated steel or similar nozzles, and vessels of glass-lined steel, porcelain, Haveg, etc. Easy to handle, single units—these adaptors combine a steel bearing ring for rigidity and a resilient core for perfect seal, both contained in a chemically inert Teflon Jacket.

UNITED STATES GASKET COMPANY

FLUOROCARBON PRODUCTS DIVISION

FABRICATORS OF "TEFLON" "KEL-F" AND OTHER FLUOROCARBON PLASTICS

CAMDEN 1, NEW JERSEY

When inquiring specify CP 2120 on handy form, pgs. 2-3

NEW LITERATURE

Properties, uses of polyethylene plastics described

Information about the properties, applications, and methods of fabricating polyethylene plastic is set forth in this 24-page, two-color booklet. Polyethylene and product design in industry are discussed. Physical, electrical, and chemical properties of the plastic are listed. Illustrated and described are several methods of fabrication, including: extrusion, calendaring, molding, casting, and coating. Booklet is illustrated with 43 photographs of materials and various applications.

Bul G-22 is issued by Bakelite Company, Div. of Union Carbide & Carbon Corp., Dept. CP, 300 Madison Ave., New York 17, N. Y. When inquiring specify CP 2121 on handy form, pages 2 and 3.

500°F, 300 lb, 550 gpm handled by pumps

Process pumps suitable for services to 500°F, 300 lb, and 550 gpm are described in 4-page, two-color bulletin. These units, in discharge nozzle sizes of 1, 1½, 2 and 3 inches, are cradle mounted, vertically split casing pumps, suitable for wide range of medium duty services found in modern refinery and process pumping applications. Pump may be arranged for mechanical shaft seal if desired.

Bul 7277 is available from Ingersoll-Rand Co., Dept. CP, 11 Broadway, New York 4, N. Y. When inquiring specify CP 2122 on handy form, pages 2 and 3.

Reports applications, specs of raw material detergent

Fully illustrated, 4-page pamphlet outlines physical properties, composition, solubility, detergency, sudsing, emollient characteristics, and applications of commercially available, raw material detergent.

This alkylarylsulfonate based detergent has been field tested in a wide range of cleaning formulations. Properly compounded, detergent offers 20-70% improvement of soil removal and whiteness retention properties evidenced in the cleaning and processing of cottons.

Pamphlet "Kreelon CD" is available from Michigan Alkali Div., Wyandotte Chemicals Corp., Dept. CP, Alkali Square, Wyandotte, Mich. When inquiring specify CP 2123 on handy form, pages 2 and 3.

Hygroscopic, surface-active agents covered in reference file

Reference file of seven scientific contributions assembled for cosmetic and pharmaceutical industries comprises 83 pages, including charts,

In 1 Plant

FEON FABRICS Save ON ALL 4

FILTER PRESS

FEON Dynel lasts 9 times longer than cotton in this pigment plant. Saves over $2500 a year.

STRING FILTER

FEON Nylon lasts a year under severe chemical conditions, compared to 6 weeks for cotton. Saves $500 a year.

SCRAPER FILTER

Under less severe chemical conditions, FEON Nylon replaces heavy cotton, saves $150 a year.

DUST COLLECTOR

Hot copper sulfate dust clogged wool bags. FEON Orlon costs less, eliminates clogging, lasts longer.

Fabric selector chart, technical data, case histories. Send for it today.

FILTRATION FABRICS DIVISION

FILTRATION ENGINEERS, INC.

155 Oraton St., Newark 4, N. J.

When inquiring specify CP 2124 on handy form, pgs. 2 - 3.

Catawissa
PERFECT SEAL
Unions

HOT FORGED from solid RECTANGULAR STEEL BARS to give you SURE-FIRE PIPING DEPENDABILITY

A TYPE FOR EVERY USE! **PERFECT SEAL even with pipe not in alignment!**

Standard & Double Extra Heavy
UNIONS
Available with screwed or socket weld ends. 3000-lb. sizes ⅛" to 3"; 6000-lb. sizes ⅛" to 2".

ORIFICE UNIONS
With screwed or socket weld ends. 3000-lb. and 6000-lb. service.

MALE & FEMALE UNIONS
With steel-to-steel, bronze-to-steel, stainless steel-to-steel or orifice seats. 3000-lb. service only.

FULL STAINLESS & FULL ALLOY STEEL UNIONS
With screwed or socket weld ends. 3000-lb. and 8000-lb. service.

CATAWISSA Ends Guesswork in Union Requirements!

CVF *write for CATALOG 11 showing the complete Catawissa line*

CATAWISSA VALVE AND FITTINGS COMPANY
620 Mill St. • CATAWISSA, PA.

When inquiring specify CP 2125 on handy form, pgs. 2 - 3.

photographs, drawings, diagrams, data tables, and bibliographies.

Information on hygroscopic agents (humectants) is particularly thorough; that on surface-active agents hinges about classification on basis of hydrophilelipophile balance; and the work of emulsions is encyclopedic. Three contributions concern apparatus for the observation and evaluation of emulsifiers.

"Fact File" is available from Atlas Powder Co., Dept. CP, 904 Market St., Wilmington 99, Del. When inquiring specify CP 2126 on handy form, pages 2 and 3.

Illustrated heating catalog available

Sixty-page, two-color information catalog describes electric heaters and heating devices in terms of application, special features, and installation. Heater-types of products illustrated include immersion, strip, cartridge, tubular, insertion, and fin heaters. Other devices described are melting pots, thermostats, switches, oven heaters, and induction heaters.

Indexed by process and application, catalog contains methods of determining power requirements and heat losses by applications. These are explained by both graphs and formulas.

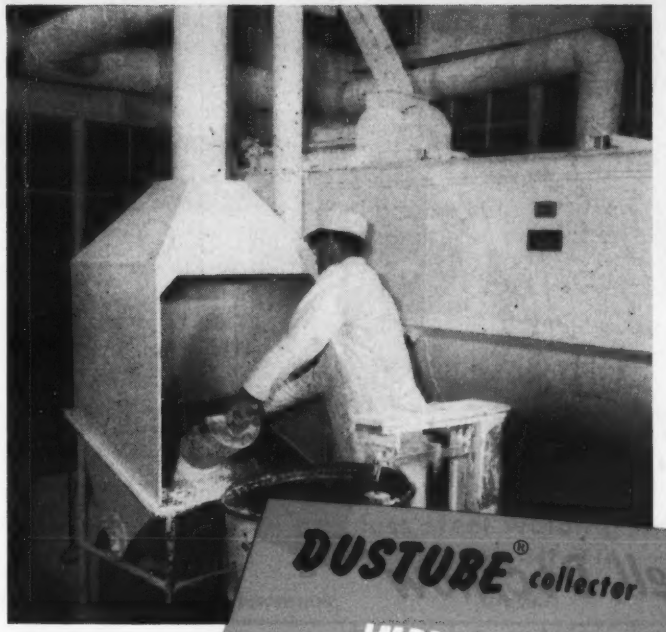
Cat GEC-1005D is issued by General Electric Company, Dept. CP, One River Road, Schenectady 5, N. Y. When inquiring specify CP 2127 on convenient Reader Service slip between pages 2 and 3.

Localized wiring simplifies pneumatic tube system

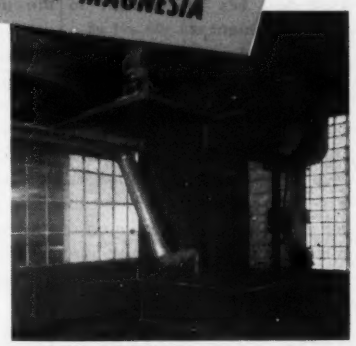
Detailed analysis of fully automatic pneumatic tube system is presented in 4-page, two-color bulletin. System is for transporting messages, punch cards, small tools, lab samples, or other small articles from one point to another. This system is said to differ from other automatic tube systems because its wiring is localized and easily accessible at each station. No central controls or complicated panel boards are required. No operator is necessary at a central relay point since carriers may be sent from any station on the system directly to any other station.

Simplicity is keynote of automatic switch system. Two tubes pass each station. To send material one need only insert it into carrier, set receiving station, and dispatch. In receiving tube ahead of each station is a switch to divert carriers out of line. Each station switch operates only for carriers that are set to be switched out through it.

Bul A-101-52 is available from Lamson Corp., Dept. CP, 303 Lamson St., Syracuse 1, N. Y. When inquiring reader may simply specify CP 2128 on convenient Reader Service slip between pages 2 and 3.



PROBLEM: The fine pharmaceutical powders used by The Chas. H. Phillips Co., Div. of Sterling Drug, Inc., created a serious dust problem in the tablet making and packaging room operations. The dust laden air settled throughout the room—a source of annoyance to the workers plus increasing plant housekeeping efforts and decreasing efficiency of the necessary air conditioning system.



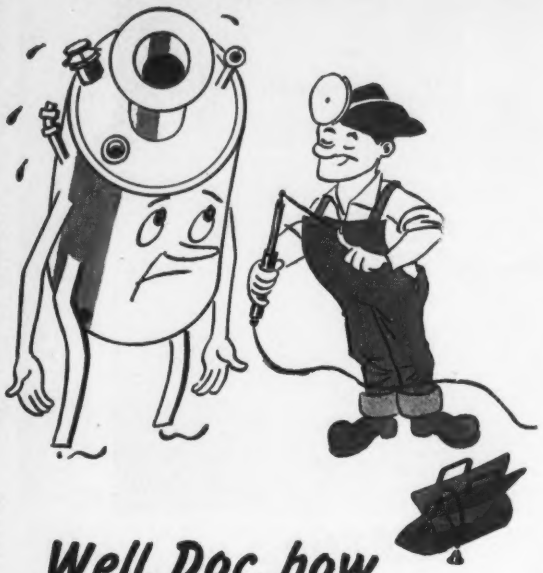
SOLUTION: A high efficiency Dustube cloth-tube-type dust collector was installed to ventilate all mixing, tableting and packaging operations in processing Milk of Magnesia.

RESULTS: In the words of Mr. R. Ross Kitchen, Plant Manager, "The Dustube Collector has proved satisfactory from the standpoint of improved working conditions, reduced cleaning of department and a definite lengthening of the life of the air-conditioning system. (Time required to clean this unit reduced 75%—man hours from 21 to 5 hours.)" Such outstanding performance is not unusual. It's the kind of efficiency and operating economy that may be expected from Dustube Collectors. Get the facts about what they can do on your dust or fume job.

Send today for Bulletin 372 and the address of your nearest Dustube field engineer.

American dustube® COLLECTORS
WHEELABRATOR & EQUIPMENT CORP.
478 S. Byrkit St., Mishawaka, Indiana

When inquiring specify CP 2129 on handy form, pgs. 2-3



Well, Doc, how long will I live?

The service life of your stainless steel processing equipment is determined by your fabricator. In the professional skill of his mechanics, welders and craftsmen lies the answer to the useful life of that equipment.

For stainless fabrication requires a specialist — with manpower trained, experienced and equipped for that work. A general practitioner might miss up on something that would impair the strength or corrosion resistance of stainless steel. The special technique required for sound welds — the right degree of heat in welding a seam, the proper finish for your application — round corner construction to allow removal of corrosive materials — these often determine how long your equipment will "live" in service.

Years of working with stainless steel have shown us that many hidden weaknesses in the finished vessel can be avoided by proper methods of fabrication. For your next stainless steel vessel, consult with us.

S. BLICKMAN, INC.
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WEEHAWKEN, NEW JERSEY

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Guards Alloys in Fabrication
SEND FOR THIS VALUABLE BOOK
A request on your letterhead will bring our guide, "What to Look For When Your Specify Stainless Steel for Your Processing Equipment."
CORROSION RESISTANT PROCESSING EQUIPMENT
TANKS • KETTLES • STILLS • HEAT EXCHANGERS • AGITATORS • MIXERS • TOWERS • PIPING

When inquiring check CP 2130 on handy form, pgs. 2-3

Estimating Pipe Wall Thickness

By JOHN J. HALFAKER and J. E. MYERS
Purdue University

Edited by D. S. DAVIS
Virginia Polytechnic Institute

THIS nomograph allows pipe (or tube) wall thickness to be estimated on the basis of pressure and temperature of the flowing fluid and the strength of the pipe material. Estimates of wall thickness are in accord with results using two equations recommended by the American Standards Association.

For ferrous pipe[2], ASA recommends that —

$$t_m = \frac{PD}{1.75\,S} + 0.1$$

where:

t_m	= thickness of pipe wall	inches
P	= pressure of fluid	psig
D	= *actual* outer diameter of pipe	inches
S	= allowable fiber stress for material	psi

Note: 0.1 (inch) is a corrosion allowance applied to ferrous pipe and tube

For non-ferrous pipe, ASA[2] recommends that —

$$t_m = \frac{PD}{S}$$

(Nomenclature as above.) Note absence of corrosion constant: this equation applies to service where pipe material will not be corroded.

Values of allowable fiber stresses for common pipe materials are given in table.

ALLOWABLE FIBER STRESS[2] at temperatures to 250°F

Material	ASTM spec	S psi
STEEL		
Electric fusion welded (GA)	A 155	9700
Seamless steel	A 120	10400
Lap-welded steel	A 120	8400
Butt-welded steel	A 120	6250
IRON		
Lap-welded wrought	A 72	7700
Butt-welded wrought	A 72	5750
BRASS, seamless		
Muntz metal	B 43	4000
High brass	B 43	4000
Admiralty metal	B 43	6500
Red brass	B 43	5500
COPPER		
Seamless annealed	B 88	5000
ALUMINUM		
Seamless 2 S-O	——	3000*

*Recommended for service at 75°F, "Chemical Engineers' Handbook," p 424, 3rd Ed.

Typical Example

Ordinary steel pipe (lap-welded) is to be used for a 3-inch water line where maximum fluid pressure is 400 psig and temperature is 100°F. What wall thickness should be used?

Read 8400 (table) as allowable fiber stress for lap-welded steel pipe. Connect 8400 on S-scale with 400 on P-scale to obtain reference ($\propto$). This reference point gives the schedule number, 1000 P/S. Connecting reference with nominal diameter of 3 (or actual OD of 3.5) locates pipe wall thickness as 0.195 inches on *ferrous* wall thickness scale.

In the case of non-ferrous pipe or tube, non-ferrous scale is used, of course, and Birmingham Wire Gage or Stub Gage number can be read directly by moving directly to right from wall-thickness reading.

LITERATURE CITED

(1) Code for Pressure Piping, American Standards Assn, B 31.1, p 22 (1942)

(2) *Ibid*, p 24-25

(3) American Standard Wrought Steel and Wrought Iron Pipe, ASA, B 36.10 (1950)

Covers complete autoclave specs and uses

Autoclaves for pressure-temperature reactions are illustrated and described in 48-page catalog. Units are used for chemical reactions such as hydrogenation, ammonolysis, polymerization, and organic synthesis.

Catalog explains safety measures taken to insure safe operation of autoclaves by purchasers. All longitudinal and circumferential butt welds are X-rayed. Entire autoclave is stress-relieved in an annealing furnace to eliminate local stresses induced by welding. The completed vessel is subjected to a hydrostatic test of twice the design maximum required.

Various possible heating systems are discussed and their advantages set forth. These systems include: hot water, steam, direct firing, indirect firing, hot oil, dowtherm liquid, dowtherm vapor, electric, induction, and high temperature units using mercury vapor or molten salts as heat transfer medium.

Also covered in catalog are materials of construction, types of agitation, stuffing boxes, and instrumentation. Autoclaves may be furnished in sizes ranging from 1 qt upward to largest commercial sizes. Agitators are manufactured for pressures to 10,000 psi.

Cat 2413 is issued by Process Equipment Dept., Blaw-Knox Co., Dept. CP, Farmers Bank Bldg., Pittsburgh 22, Pa. When inquiring specify CP 2131 on handy form, pages 2 and 3.

Drainage, seepage water damage minimized with sump pump

Vertical sump pumps, built to provide protection against costly damage often caused by seepage or unexpected drainage water, are described in 8-page bulletin. Five standard sizes, which fill average requirements for industrial application, are discussed and illustrated. Detailed specifications are given on all pumps which range in capacity from 20 to 1200 gpm.

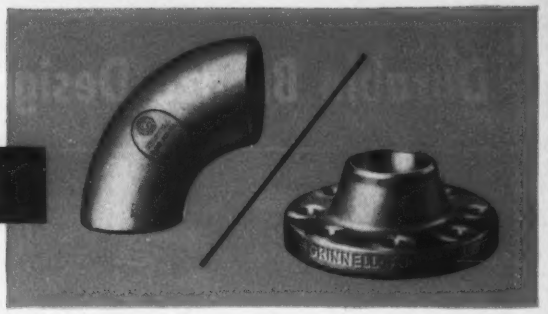
Bul S-852 is issued by Taber Pump Co., Dept. CP, 288 Elm St., Buffalo 3, N. Y. When inquiring specify CP 2132 on handy form, pages 2 and 3.

Volatile and toxic mediums handled by fuel valve

On-off, bellows-sealed fuel valve (Type 27) is fully described and illustrated in 2-page specification sheet. Valves are particularly designed for handling volatile and toxic mediums. Sheet gives pertinent data such as size, construction, materials, and mounting dimensions.

Spec Sheet 424 is available from Station 64, Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne and Windrim Ave., Philadelphia 44, Pa. When inquiring specify CP 2133 on handy form, pages 2 and 3.

for trouble-free service



GRINNELL

STAINLESS STEEL WELDING FITTINGS and FLANGES

To help combat mounting costs in the installation and maintenance of piping systems where corrosive or certain other service conditions are involved, Grinnell offers a comprehensive range of welding fittings and flanges in stainless steel.

- To prevent corrosive attack.
- To obtain adequate impact resistance at low temperatures and sufficient creep strength at high temperatures.
- To provide sanitary conditions.
- To avoid contaminating the product.

Grinnell welding fittings and flanges are available in types 304, 347 and 316. These are in the chromium-nickel grades known as "18-8". The corrosion resistant properties of stainless steels are primarily due to the chromium content which ranges from 17% to 20%. The addition of nickel in ranges from 7% to 14% improves the corrosion resistance as well as the properties at elevated temperatures. A molybdenum addition of 2% to 3%, as found in type 316, increases the resistance to sulphurous and phosphoric acids, brine and hypochlorite solutions, and improves the general resistance to other corrosive liquids, as well as improving the physical properties at elevated temperatures. A columbium addition of approximately 0.4% to 1.0%, as found in type 347, creates non-susceptibility to carbide precipitation which can cause intergranular corrosion.

In addition to stainless steel, Grinnell offers welding fittings and flanges in carbon steel, nickel, Inconel, Monel, aluminum and brass.

Write for new booklet giving complete data on Grinnell stainless steel welding fittings and flanges. No obligation.

stainless steel welding fittings
Types 304, 347, 316

DESCRIPTION	SCHEDULE†	PIPE SIZE, IN.‡
90° Long Radius Elbow 45° Long Radius Elbow 180° Long Radius Return	5s, 10s, 40s, 80s	½ to 12
Straight Tee Reducing Tee	5s, 10s, 40s, 80s	¾ to 12
Cross (Straight and Reducing)	5s, 10s, 40s, 80s	1¼ to 12
Concentric Reducer Eccentric Reducer	5s, 10s, 40s, 80s	¾ to 12
Lateral (Straight or Reducing)	5s, 10s, 40s, 80s	1 to 12
Cap	5s, 10s, 40s, 80s	½ to 12
Lap Joint Stub End-Long	10s, 40s, 80s	½ to 12
Lap Joint Stub End-Short	5s, 10s, 40s,	½ to 12

† *5s is Featherweight, 10s Lightweight, 40s Standard, 80s Extra Strong.*
‡ *Larger sizes available on special order.*

stainless steel flanges

150 lb. and 300 lb. Steel Flange Standard *(Higher series available on application).*

DESCRIPTION	PIPE SIZE, IN.
Welding Neck Slip-on Lap Joint Threaded Socket Type Blind	½ to 24

150 lb. Corrosion Resistant Standard. *(For use with schedule 10s and 5s pipe. Rated at 150 psi at 500°F, 225 psi at 150°F, when used with full-faced gaskets).*

DESCRIPTION	PIPE SIZE, IN.
Buttwelding Slip-on Blind	½ to 12

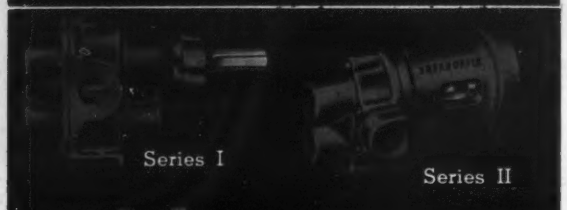
GRINNELL
WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

When inquiring check CP 2134 on handy form, pgs. 2-3

Durable Bronze Design



Series I—Heavy duty bronze rotary gear pumps
Oilless bearings 2-23 G.P.M.—0-100 P.S.I. $14.25-$29.75 (six pumps)

Series II—Close coupled motor driven bronze pumps
Oilless bearings 2-4 G.P.M.—0-100 P.S.I. $20.00-$22.50 (two pumps)

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Oilless bearings 6-21 G.P.M.—0-30 P.S.I. $16.00-$28.00 (three pumps)

Series 55—Standard bronze rotary gear pumps
Grease fittings 2-23 G.P.M.—0-100 P.S.I. $11.25-$29.00 (twelve pumps)

Series G—Standard bronze centrifugal pumps
Grease fittings 2-25 G.P.M.—2-10 P.S.I. $9.25-$24.00 (three pumps)

See our catalog in Sweet's PRODUCT DESIGN File

OBERDORFER
BRONZE PUMPS

Industrial Pump Div., Oberdorfer Foundries, Inc.
636 Thompson Rd., Syracuse, N. Y.

Address the 1953 edition of the Oberdorfer Industrial Pump catalog to:

NAME _____

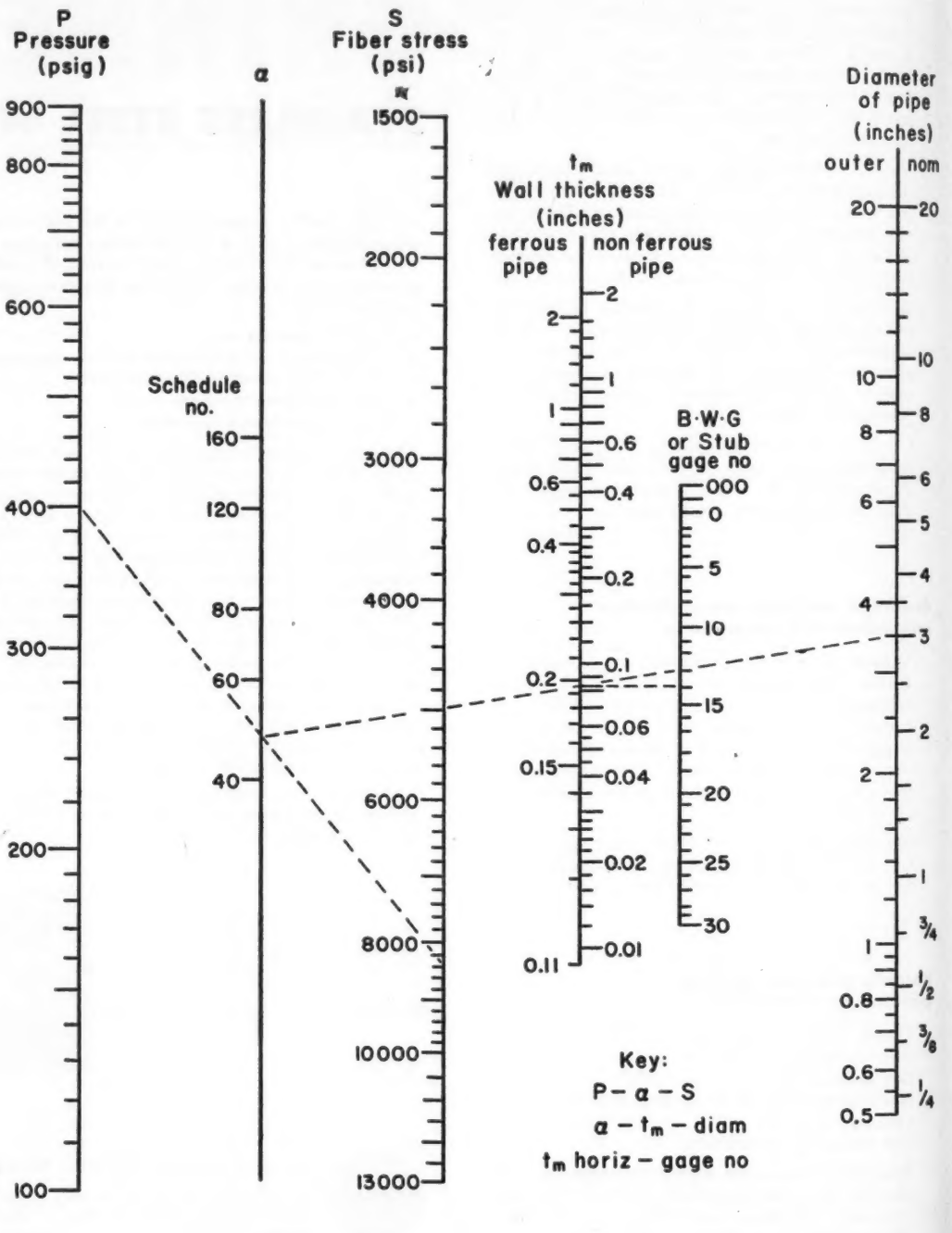
COMPANY _____

ADDRESS _____

Do you want a factory representative to call ☐ Yes ☐ No

When inquiring check CP 2135 on handy form, pgs. 2-3

Estimating Pipe Wall Thickness



Specs on low-voltage switchgear, air circuit breakers

Two bulletins describe and give specifications for company's line of low-voltage drawout switchgear (Bul GEA-5916) and the air circuit breakers used in this equipment (Bul GEA-5915).

Bulletin GEA-5916 illustrates and describes in some detail low-voltage drawout switchgear for load-center substation systems with 600-volts (maximum) and 15 to 4000-amperes. Complete information is given on installation and design of switchgear. Both indoor and outdoor installations are illustrated, and standard specifications are given for each.

Second bulletin (GEA-5915) gives complete line-up of low-voltage air circuit breakers used with switchgear equipment. Able to withstand 30-cycle momentary currents equal to their interrupting ratings (15,000 to 100,000 amperes), air circuit breakers used in equipment make it possible to have fully selective tripping with all breakers applied up to their full interrupting ratings. Continuous current ratings range from 15 to 4000 amperes.

Important feature of breakers is stored-energy closing mechanism used for electrical operation of 50, 75, and 100 kva interrupting rated breakers. Mechanism insures closing and latching against full rated short circuit even though control voltage is completely lost when the breaker contacts first touch. This is accomplished by energy stored in a spring before closing operation is begun. All breakers are equipped with triple-characteristic over-current tripping devices which provide long or short time delay or instantaneous characteristics as required for different applications.

Buls GEA-5916 and GEA-5915 are issued by General Electric Co., Dept. CP, One River Road, Schenectady 5, N. Y. When inquiring specify CP 2136 on handy Reader Service slip between pages two and three.

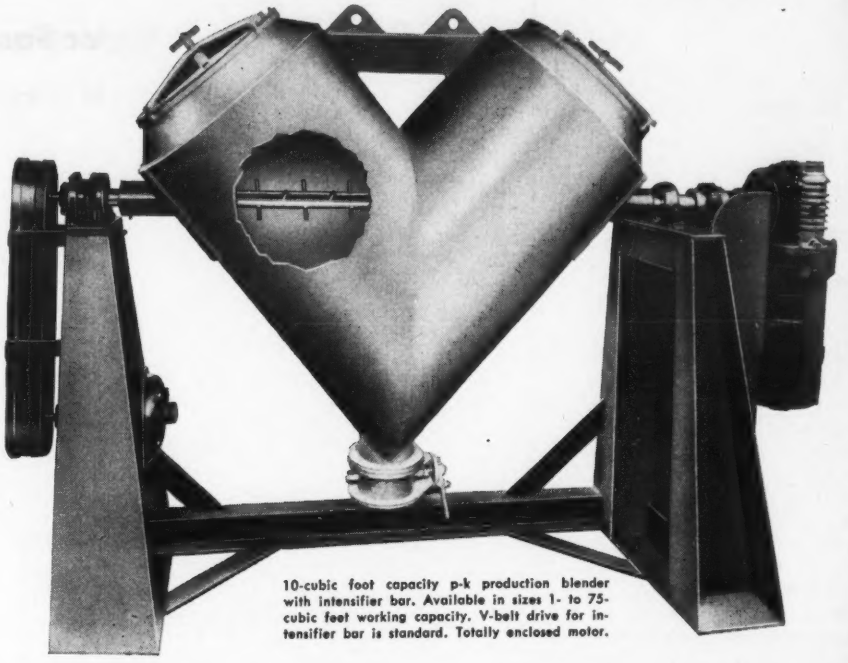
Membrane "lung" saves volatile products stored in tanks

Feature of Dialift tanks, for new storage installations or as a conversion of existing cone roof tanks, is membrane which functions as "lung" of a single or battery of storage tanks. This membrane, attached gas-tight to inside circumference of Dialift unit, lifts with pressure of gas or vapor accumulation and lowers as gas or vapors diminish; thus eliminating breathing losses and reducing filling losses.

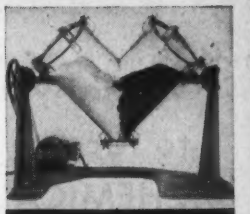
Bulletin details values of tank, lists its range of sizes, illustrates construction, describes its use as single unit or when tied in with battery of tanks, and explains uses as a conversion of existing cone roof tank.

Bul 53DL is available from Hammond Iron Works, Dept. CP, 630 Fifth Ave., New York 20, N. Y. When inquiring specify CP 2137 on handy form, pages 2 and 3.

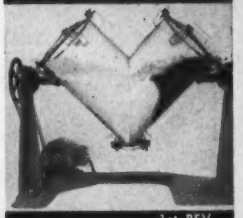
Now....it's easy to blend hard-to-mix materials



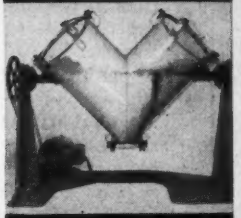
10-cubic foot capacity p-k production blender with intensifier bar. Available in sizes 1- to 75-cubic feet working capacity. V-belt drive for intensifier bar is standard. Totally enclosed motor.



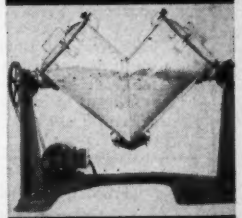
LOAD
As this typical test illustrates, the effectiveness of this new blending principle assures a thorough blend in minutes.



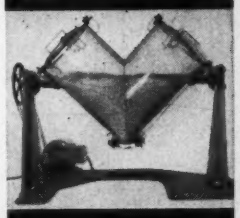
1st REV.
The gentle rolling, folding, dividing and combining action with a simultaneous cross flow can be seen in the first revolution.



5th REV.
End-to-end dispersion and intimate mixing becomes evident. This is true regardless of particle size, form or density.



1 MIN.
The mass rotates close to the axis and does not require rapid rotation. Neither separation nor attrition takes place.



2 MIN.
A thorough blend has been achieved. Laboratory or pilot plant blender illustrated is available in 4-and 8-quart sizes.

using p-k *twin shell dry blenders with intensifier bar*

simply designed for better blending

Versatile as **p-k** twin shell blenders are, they are now made even more so with the addition of an intensifier bar.

More kinds of materials can be processed, such as lumps which occur before and during blending and for dispersion of fluids. Variable speed V-belt drive permits adjustment of intensifier bar action to suit material being processed. Quick opening, dust tight cover makes loading quick and easy.

Rotation of **p-k** twin shell blenders, continuously supplies fresh material to the pins which provide intense local mixing action. The high impact combined with shear, effectively breaks up lumps, disperses materials that tend to agglomerate while tumbling and thoroughly disperses dampening quantities of liquids into solid mixes.

When your process planning includes a blending operation, it will pay you to ask **p-k** for blending tests on your materials and for engineering assistance at the initial planning stage. Since **p-k** also makes double-cone and ribbon blenders, an unbiased analysis of your blending methods is assured. Or, write for factual literature—Catalog No. 12, showing production and laboratory blenders.

Patented and patents pending

the Patterson-Kelley Co., inc.

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When inquiring specify CP 2138 on handy form, pgs. 2-3

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*"Substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

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Main Products .....

46

Vapor Pressures of Esters

of Alkyl Lactates and Adipic Acid

By D. S. DAVIS
Virginia Polytechnic Institute

A RECENT study[1] of the adipates of butyl, capryl, and 2-ethylhexyl lactates as plasticizers for vinyl chloride copolymer includes data on the vapor pressures of these esters. Nomograph presented here makes these data easily available. It is based on this equation:

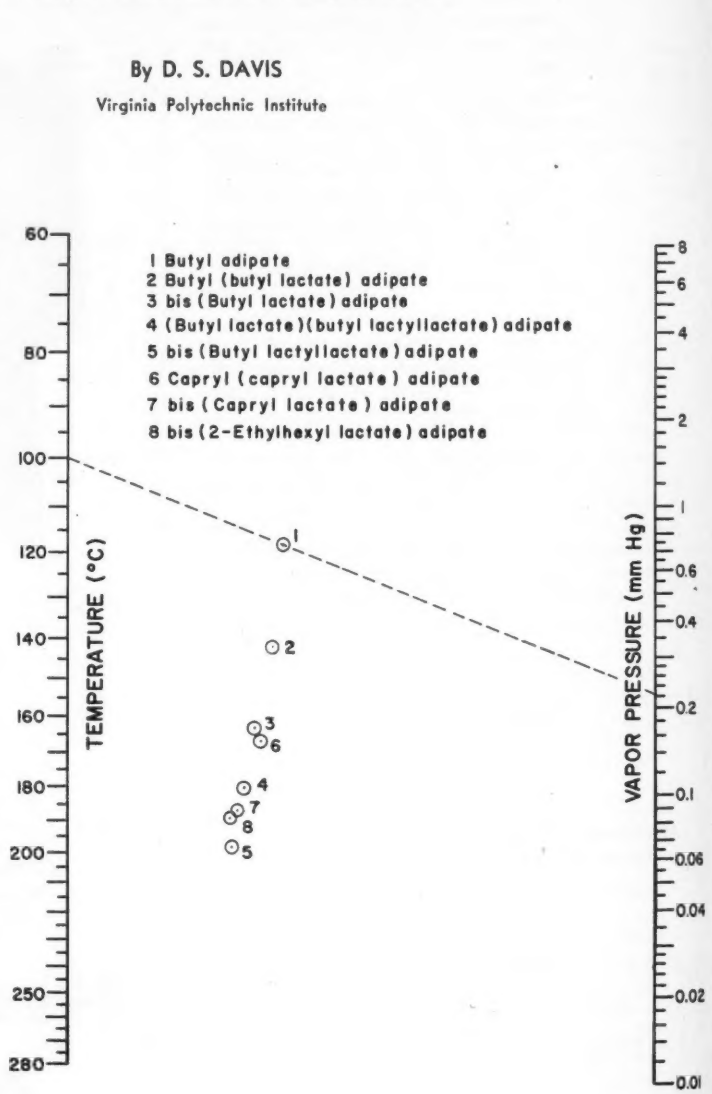
$$\log P = A - \frac{B}{(t+273)}$$

where —
P = vapor pressure, mm Hg
t = temperature, °C
A,B = constants

Typical Example

What is the vapor pressure of butyl adipate at 140°C?

Connect 140 on temperature scale with point 1 for butyl adipate. Intersection with vapor pressure scale shows 2.7 mm of mercury.



LITERATURE CITED

(1) REHBERG et al, *Ind Eng Chem*, Vol 44, p 2191-5 (1952)

Cleaning, inspection made easy on automatic boiler

Line of automatic boilers, described in 4-page booklet, features clean-out-and-inspection doors on both ends which are hinged and can be opened easily by one man in 30 minutes. Boilers range in size from 20 to 500 hp, and each model has guarantee of 80% efficiency.

Advanced two-pass design on boiler eliminates baffles. Only refractory used is for lining of easily removable front and rear covers. Major uses for boilers are as heating units, and as source of steam for process industries.

Booklet includes detailed engineering data and specifications, and discusses features and advantages of boilers.

Form 102 is available from Boiler Engineering and Supply Co., Inc., Dept. CP, Phoenixville, Pa. When inquiring specify CP 2140 on handy Reader Service slip between pages two and three.

Bulletin presents specs, on alloy tubing steel

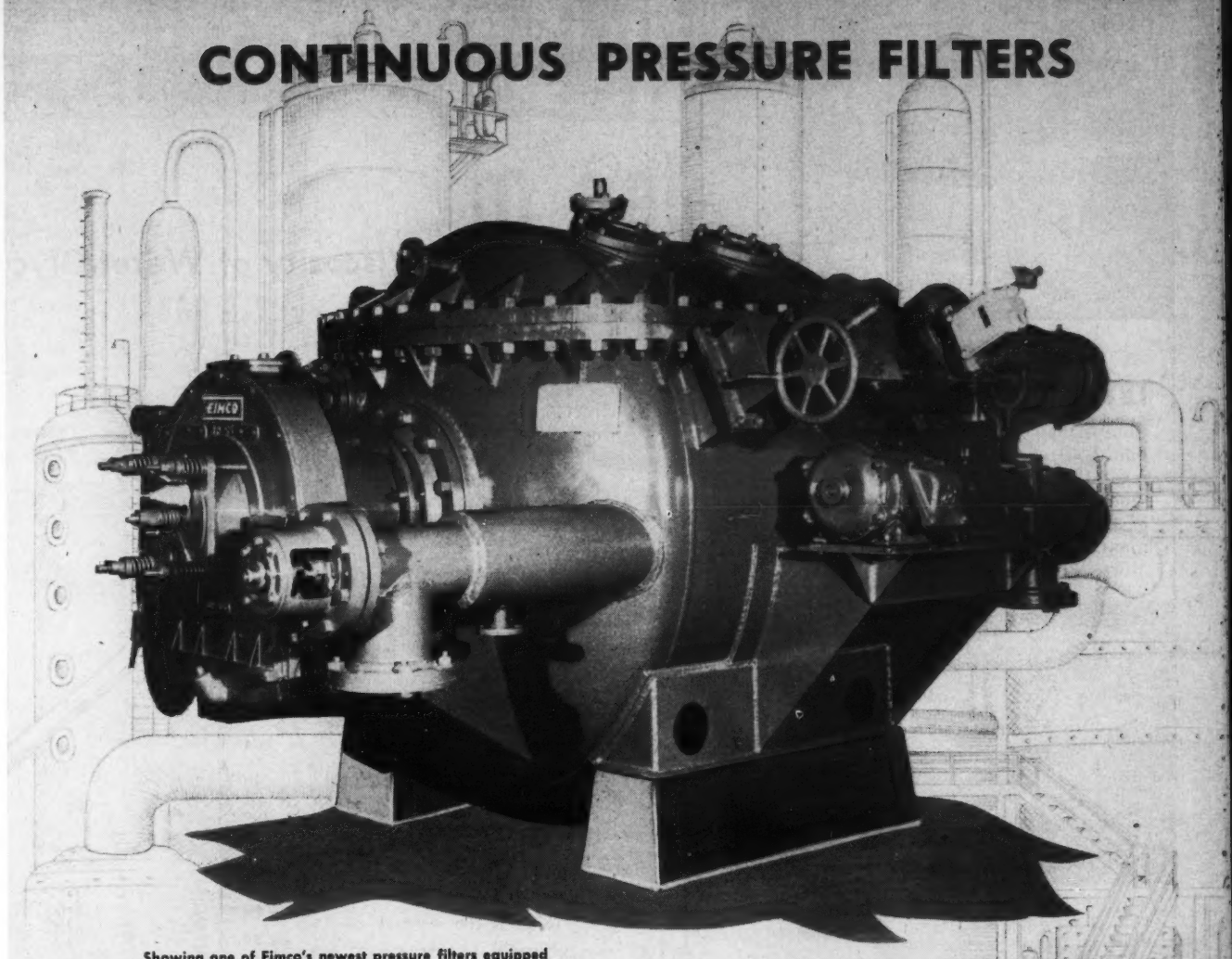
One of the alloy tubing steels used in elevated temperature service is discussed in 6-page, two-color bulletin. This steel has proven its value in refinery and other process industry applications as furnace tubes, piping and superheater tubing.

It is particularly resistant to corrosion from hot oil, hydrogen sulfide, elementary sulfur, and organic sulfur compounds as encountered in petroleum processing. Included in bulletin are data on mechanical properties, creep strength, physical properties, welding, fabrication, and heat treatment.

Bul TDC-146 is issued by Babcock and Wilcox Co., Tubular Products Div., Dept. CP, Beaver Falls, Pa. When inquiring specify CP 2141 on handy form, pages 2 and 3.

For more information on product at right, specify CP 2142 . . . see information request blank between pages 2 - 3.

CONTINUOUS PRESSURE FILTERS



Showing one of Eimco's newest pressure filters equipped for dewatering and washing with automatic precision scraper blade advancing mechanisms.

Every Eimco Filter for vacuum or pressure operation, or combination of the two, is a custom built machine designed and constructed to meet the specific requirements of your process.

The machine pictured above is another typical example of Eimco custom built filter design. This filter is part of the flow sheet in a plant producing phenol, acetone and alphamethyl styrene. The purpose of the filter is to remove sodium sulphate crystals and small amounts of water and it was also necessary that the phenol in precoat cake be reduced to .05% washing with crude acetone and separating the strong and weak filtrates.

Eimco's testing and development departments are staffed with experienced chemical and metallurgical engineers whose work with consulting engineering firms and the engineering departments of many producing companies has resulted in economies in operation and production of their product.

May we have an opportunity to consult with you and quote on your filter requirements?

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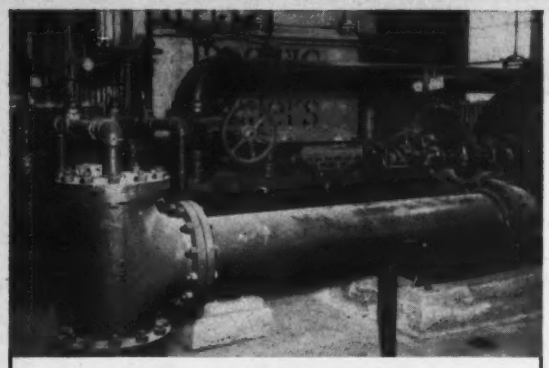

"K" Fittings in largest helicopter plant

Conspicuous in the above photo are some of our big flanged tees and elbows. You will also see several of our companion flanges and screwed elbows. This is one of the numerous installations of "K" Fittings in the world's largest helicopter plant, that of Piasecki Helicopter Corporation, Morton, Pa.

Plant of Piasecki Helicopter Corporation

Piasecki H-21 Work Horse currently on the production line.

Good workmanship sells "K" Fittings

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Combined marketing facilities with Malleable Iron Fittings Company, Branf rd, Conn.

When inquiring check CP, 2143 on handy form, pgs. 2-3

Viscosity of Water-Glycerine Solutions

By R. E. HERRON

Edited by D. S. DAVIS
Virginia Polytechnic Institute

BASED on previously unpublished data[3], nomograph can be used to estimate viscosity of aqueous glycerine solutions from 0 to 95 per cent glycerine by weight. Temperature range covered is 20 to 50°C.

Construction is based on the equation:

$$\log \mu = \frac{A}{t + 230} + B$$

where —

t = temperature °C

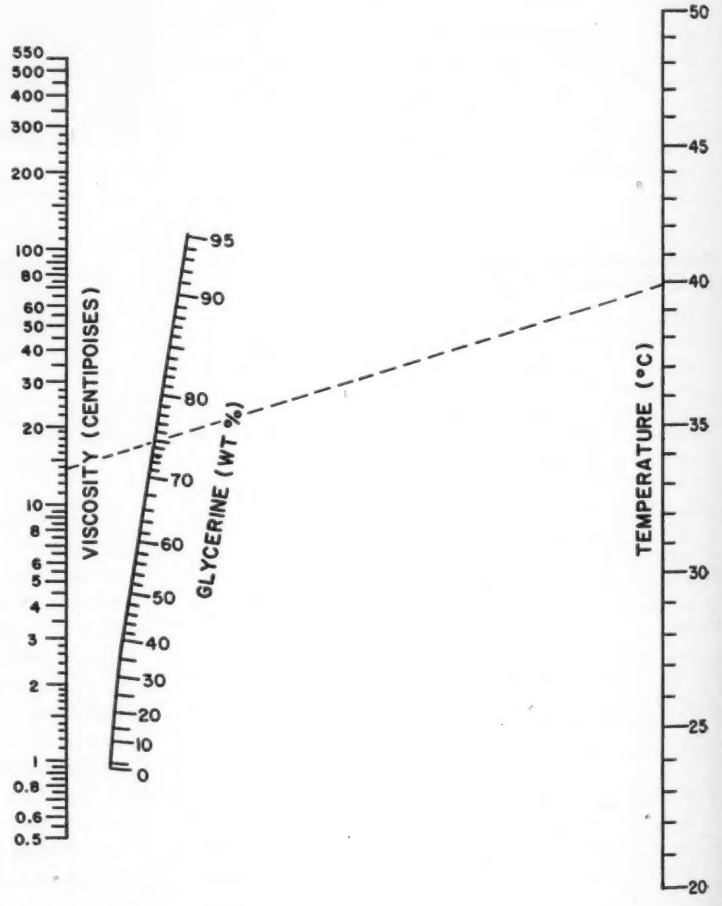
A,B are empirical constants based on glycerine concentration in water.

Chart was prepared by methods previously described[1] and compares favorably with earlier published data[2].

Typical Example

What is the viscosity of 75 per cent glycerine at 40°C?

Connect temp of 40 with concentration of 75 and read viscosity as 13.8 centipoises.



LITERATURE CITED

(1) DAVIS, "Empirical Equations and Nomography," p 140-142, McGraw-Hill Book Co., (1943)

(2) DAVIS, "Nomograph for Viscosity of Aqueous Glycerine," *Chem Eng* Vol 59, No. 4, p 178 (1952)

(3) HERRON, "The Determination and Correlation of Viscosity, Temperature, and Concentration Relations of Aqueous Glycerol Solutions," VPI (1952)

Pocket-size book covers thermistor uses

Thirty-six pages long, paper-bound, pocket-size book provides comprehensive data about thermistors. Introduction covers background and the "what, where and how" of thermistors. Types of construction, and operating characteristics are reviewed.

Data book provides several excellent graphs, showing behavior in various uses and under various conditions. Circuits are included for typical applications, such as time delay, switching, power measurement, etc. Mathematical tables and methods enable performance to be predicted. Publication concludes with bibliography citing 50 or 60 important articles on thermistors.

"Thermistor Data Book" is issued by Victory Engineering Corp., Dept. CP, Springfield Road, Union, N. J. When inquiring specify CP 2144 on handy form, pages 2 and 3.

All about dial thermometers, and pressure gages

Two-color bulletin, 24 pages long, describes latest development in 6-inch dial indicators for temperature, pressure, and load applications. Thoroughly illustrated with photos, drawings, and actual reproductions of dial scales, bulletin covers all phases of interest.

Various methods of actuation are covered — for temperature instruments, a variety of sensitive elements or bulbs are clearly explained. Recommended applications for each is given, so that selection is simplified. Mounting dimensions of all types pictured are included. Bul 98214 is issued by Taylor Instrument Companies, Dept. CP, 95 Ames St., Rochester 1, N. Y. When inquiring specify CP 2145 on form, pgs. 2 & 3.

Dependability, long life offered by multi-stage pumps

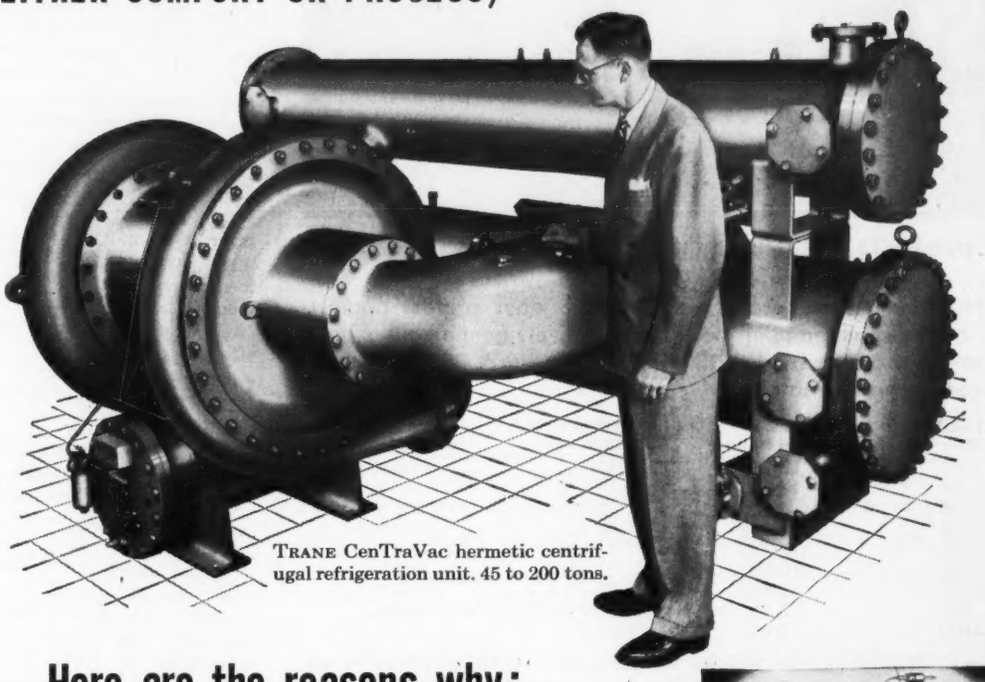
Complete line of 2, 3, 4, and 5-stage split-case pumps — described in 12-page, illustrated bulletin — offers dependability and long life. Detailed data on specifications is included in bulletin. Pumps are designed with capacities up to 3000 gpm, head ranges to 1600 feet, with case pressure capacities to 400 lb, and to withstand liquid temperature to 300°F. Up to 8-inch discharge sizes are available in 2-stage designs.

Entire rotating element of pump can be removed for inspection and repair without disturbing pump alignment or piping. Standard construction is cast iron, bronze fitted, but cases may be obtained in steel, all bronze, or other alloys. Pump drives can be either electric motor, stationary engine, or steam turbine.

Bul B-1400 is issued by Peerless Pump Div., Food Machinery and Chemical Corp., Dept. CP, 301 West Avenue 26, Los Angeles 31, Calif. When inquiring specify CP 2146 on form, pgs. 2 & 3.

Here's the low cost way to get chilled water

(FOR EITHER COMFORT OR PROCESS)



TRANE CenTraVac hermetic centrifugal refrigeration unit. 45 to 200 tons.

Here are the reasons why:

1. Brings big-job economies to all installations . . . for the first time, the proved money-saving advantages of centrifugal compressors are available to small and medium-sized jobs . . . down to 45 tons.

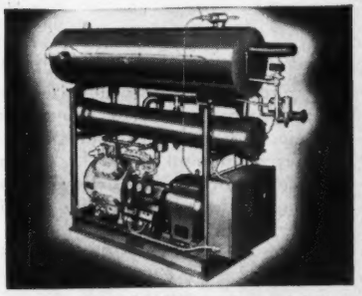
2. Complete in one package . . . self-contained . . . all components are perfectly integrated, therefore operate more efficiently (at less cost).

3. Easier to install . . . light, compact . . . needs no special base, only simple water and electrical connections. Saves on installation costs.

4. Completely automatic . . . needs no special attention . . . a push-button operation. Frees attendant for other duties.

5. Fewer moving parts mean fewer breakdowns, less maintenance. No shaft seals or gear boxes at all. Only *one* major moving part.

6. Built-in automatic capacity control permits operation down to 10% of rated capacity . . . saves power.



Here's the answer for 10 to 50-ton jobs! A completely packaged water chiller . . . ready to install. The new TRANE Cold Generator comes completely assembled, wired, piped, refrigerant-charged.

TRANE CenTraVac cuts chilled water costs 6 ways

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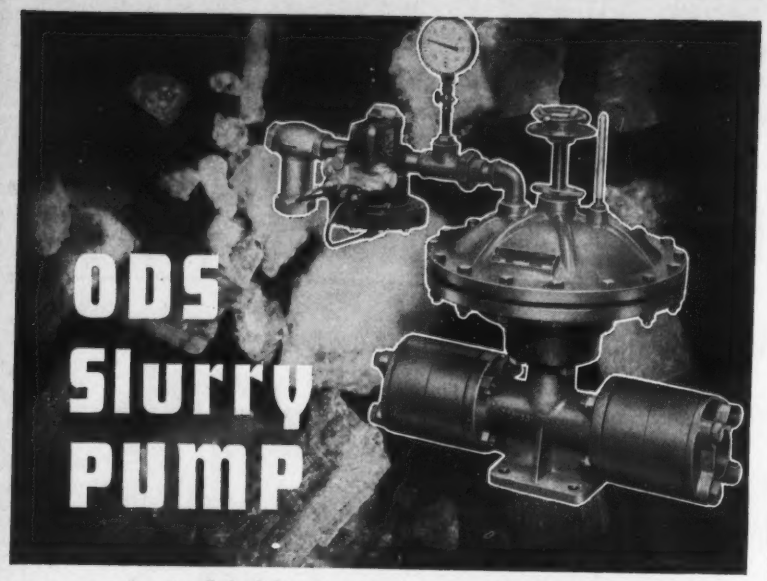
MANUFACTURING ENGINEERS OF AIR CONDITIONING, HEATING AND VENTILATING EQUIPMENT



. . . protects friable crystals against degradation

AND here's some proof that the ODS does protect against crystal spoilage . . . proof of the relatively gentle handling of crystalline products by the ODS Diaphragm Slurry Pump which in this case is grainer salt.

Screen Mesh	Salt at Grainer Discharge	Salt After ODS Pump*	Salt After Centrifugal Pump*
10	10.2%	11.4%	1.6%
14	17.8%	18.3%	7.3%
20	15.6%	17.7%	9.8%
28	22.0%	24.6%	11.5%
35	14.9%	14.6%	20.6%
48	10.0%	7.6%	18.6%
65	5.4%	3.1%	11.2%
100	2.2%	1.0%	6.0%
–100	1.9%	1.7%	3.4%

*Note that both pumps had a 160 foot carry and a 45 foot lift. Note also, that in certain sizes, there was actually a measurable increase in crystal size resulting from the ODS brine cooling effect.

Degradation of crystalline size and structure is important when the slurry in your process is handled, you certainly should check on the merits of the ODS Pump. Even if crystal degradation is not an important factor, other advantages will appeal to you . . . advantages such as low maintenance, no mechanical linkage to the diaphragm, no weakening holes in the diaphragm, no clogging of the valves. Write or call our nearest sales office.

308-R & 309-R

Bulletin 309-R gives full details of the ODS Pump. Shall we send you a copy?

If you are handling clear chemical solutions of any type, hot or cold, our Olivite Acid Handling Pump will probably serve you best. Shall we send you a copy of Bulletin 308-R?

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When inquiring check CP 2147 on handy form, pgs. 2-3

Chemicals in the Economy

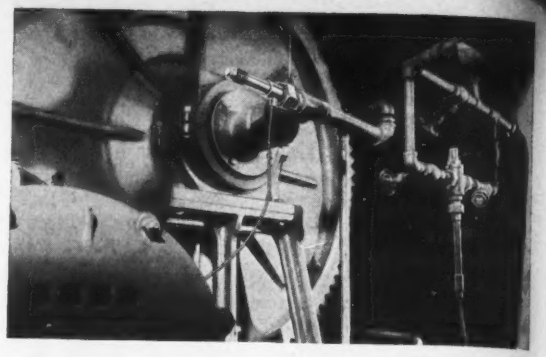
(*Continued from page 5*)

tivity and discourage erosion losses by improving soil structure.

Because of the increasing population and the limited amount of fertile soil, agriculture's challenge to our industry is still an imposing one. We can develop more potent and more specific insecticides and herbicides: we must outwit our insect enemy by having new potions on hand when he develops immunity to existing ones. We must learn more about soil structure, to ensure effective use of conditioners, and we must study plant hormone systems so as to produce crops of high quality and to prevent loss through frost and windstorm damage. Deserts may be made to bloom by irrigation with water demineralized by permionic membranes; loss in storage can be reduced by better fumigants; loss from blight must be prevented by effective fungicides and cures for virus diseases. The list is endless! It is an irresistible challenge to the creative chemist.

Growth in the synthetic fiber business, in contrast to growth of agricultural chemicals, has tended toward replacing fibers rather than opening new markets. However, increased knowledge of fiber properties has eliminated the elusive concept of a universal or ideal fiber. Each fiber has unique and useful properties, but we've found that no fiber combines all these properties. We will, however, come up with ideal fibers for ideal uses: blended fabrics combining the best qualities of several fibers. Nylon will give strength, and the acrylics warmth without weight; we'll choose Dacron for springiness, crease-recovery, and abrasive resistance; and rayon and acetate for anti-static stabilization and absorption of color. Combinations of wool and cotton with the synthetics to give superior properties will be extensively employed; indeed, so positive is this trend that by 1955 it is predicted that one-half of all clothing will contain man-made fibers.

Though production of synthetic fibers has boomed, we've hardly scratched the surface. The growth potential is enormous, and is intensified by an increasing world population, higher per capita fiber consumption, and the application of fibers in unconventional end-uses. The ceiling might well be un-



Paint Grinding Controlled

Picture shows one of a battery of pigment grinding mills at the plant of Grand Rapids Varnish Corporation, Grand Rapids, Mich.

The rotating drum (or pebble mill) is equipped with a jacket through which cooling water is circulated.

This water is held at the desired temperature by a Sarco self-operated cooling control, Type TR-21R.

These simple, inexpensive regulators are available in sizes ½" to 8", and are widely used to control the temperature of cooling water or brine in air conditioning, cold storage, still condensers, internal combustion engines, compressors, etc.

Write for Catalog 700-12 to *Sarco Company, Inc., Empire State Bldg., New York 1, N. Y.* *Advt. 606*

When inquiring check CP 2148 on handy form, pgs. 2-3

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for chemical spraying, cooling, humidifying, dehydrating, and hundreds of other applications
You'll get the right nozzles quicker by calling Binks...manufacturers of one of the most complete selections ever produced. A wide range of spray patterns, sizes, capacities... with nozzles cast or machined from standard or special corrosion-resistant metals.
Binks Manufacturing Company
3120-32 Carroll Ave., Chicago 12, Ill.
O. K. BINKS. Send me your Spray Nozzle Catalog...FREE!
NAME
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Binks
A COMPLETE LINE OF INDUSTRIAL SPRAY NOZZLES AND COOLING TOWERS

When inquiring check CP 2149 on handy form, pgs. 2-3

NEW Corrosion-Resistant

Speedline fittings

LOWER PIPING COSTS result when you use *Speedline* fittings, because you can use lightweight Schedule 5 pipe. Increased ID of Schedule 5 pipe gives lines increased capacity.

RAPID INSTALLATION is possible because the *Speedline* method often eliminates the need for welding or flaring.

Write for your copy of this 20-page *Speedline* catalog. It gives you the entire story.

Speedline distributors are located in principal cities from coast to coast

HORACE T. POTTS CO. Since 1815

Erie Avenue & D Street, Philadelphia 34, Pa.
Baltimore Branch Warehouse, 2835 Sisson Street

When inquiring check CP 2150 on handy form, pgs. 2-3

EFFICIENCIES UP TO 98%

PHILADELPHIA SPIRAL BEVEL-HELICAL SPEED REDUCERS

For vertical or horizontal right angle drives where high efficiency and smooth dependable operation are desired, Philadelphia Spiral Bevel - Helical Reducers are widely preferred. They are available in single, double and triple reduction types in standard ratios from 1 to 1 up to 238 to 1. First reduction is always through spiral bevel gears set while precision shaved helical gears are employed in second and third reductions of double and triple types.

For details write for Catalog SB-50

PHILADELPHIA GEAR WORKS, Inc.
ERIE AVENUE AND G STREET • PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA.

When inquiring check CP 2151 on handy form, pgs. 2-3

limited, and he who gets there "firstest with the mostest" will have the edge.

Lastly, the plastics industry, has, in my opinion, achieved maturity during the past decade. Ten years ago plastics meant only bright-colored toys and novelty items to most people: today, plastics have been recognized as structural materials — substances which can be used to build things with, from ash trays to table tops to automobiles to boats.

To name the outstanding development in plastics during recent years is like reading down a "Who's Who of the Plastics Industry."

We have vinylidene halides, Teflon and Kel-F — famous for their strength, chemical restistance and stability over a wide temperature range. We have polyesters for laminates; alkyds and styrenated alkyds for coatings; melamine resins for toughness as well as strength; nylon for molding compounds; and silicones that are able to bridge the gap between organic and inorganic polymers and thereby open up a whole new area for exploration.

Ten years ago, polystyrene was almost a laboratory curiosity; in 1951 production of styrene plastics reached a smashing 375 million pounds and the way looks clear ahead. One could also paint a glowing picture for polyethylene, polyvinyl chloride and vinyl chloride copolymers. It seems to me that future trends will emphasize a further development of existing polymers.

Another important aspect of that development is exploration of the products produced by copolymerizing materials, or by blending two or more polymers. Just as alloys of metals have unique properties, so do "alloys" of polymers have properties not found in individual polymers alone. Work in this phase of the industry is comparatively recent, but already several successful products have been achieved.

These, then, are a few of the chemical substances which have effectively contributed to the nation's economy. They have enabled our industry to exert a heartening effect on the nation's over-all business climate, and I feel confident, they will continue to do so in the future.

The OLIVITE Acid-Handling Pump is really 2 pumps in one!

Yes, many chemical plant operators have come to regard the Olivite Pump as two pumps in one . . . one, an efficient centrifugal pump for handling liquids; the other, a durable pump with high resistance to corroding solutions.

In one large chemical plant with extensive acid-pumping operations, more than 100 Olivite Acid-Handling Pumps are now in service. They are handling several different solutions, both hot and cold, with widely varying pH values.

Thousands of these corrosion resistant and leak-resistant pumps have been supplied to industry through the years. Chances are the Olivite could fit very nicely into your pumping operations. Write for our Bulletin 308-R, which gives complete information. When you do, please give full details of your pumping problems.

It is possible you may also be interested in the ODS Diaphragm Type Pump which gives excellent results in pumping solutions as well as slurries. Bulletin 309-R gives full details.

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

OLIVER UNITED FILTERS OUF INC.

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FACTORIES: Hazleton, Pa. Oakland, Calif.

When inquiring check CP 2152 on handy form, pgs. 2-3

TABER

DRAINAGE WATER
Protection....

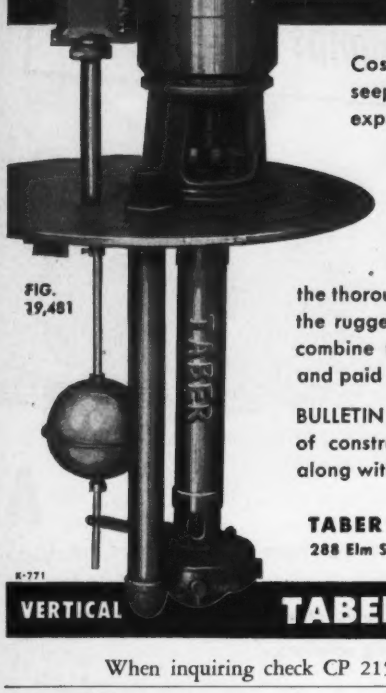


FIG. 19,481

Costly damage, often caused by seepage water, floor drainage or unexpected water . . . can be best avoided by the installation of a dependable, rugged automatic vertical Taber Sump Pump like Fig. 19,481.

When an emergency arises, the thoroughness of Taber engineering and the ruggedness of Taber construction . . combine to deliver the protection sought and paid for.

BULLETIN S-852 containing eight pages of construction and engineering details, along with rating tables, on request.

TABER PUMP CO. *(Est. 1859)*
288 Elm St. Buffalo 3, N. Y.

K-771

VERTICAL **TABER SUMP PUMPS**

When inquiring check CP 2153 on handy form, pgs. 2-3

RICHMOND
super-sifter

"... doing a better job ..." in a Wood Flour Mill

Mr. James B. Stamps, Vice-President, Allen-Rogers Corporation (turned wood products) recently wrote:

"Our new flour mill has been in operation for something over a year now, and we have had an opportunity to observe closely the results which we are obtaining from the sifter, magnets, and stream splitter which we purchased from your company.

"We are very happy to tell you that in all cases these are performing satisfactorily and are indeed doing a better job than any other similar devices which we have used in the past."

Perhaps your plant can profit from the use of RICHMOND SIFTERS, too.

R-21

RICHMOND MANUFACTURING COMPANY
AFFILIATED WITH NOVADEL-AGENE CORP.
LOCKPORT, NEW YORK

When inquiring check CP 2154 on handy form, pgs. 2-3

Synthetic Fibers

(*Continued from page 7*)

plans were laid to go ahead with manufacture. Carothers and his associates, however, continued their work of investigating other chemical combinations.

One of the starting materials for the new superpolymer was scarce adipic acid, at that time made only in Germany. Roger Williams of Du Pont's Ammonia Department directed work which resulted in the process for making adipic acid from phenol. Greenewalt directed the work of the Chemical Department in setting up a process for the other starting material, hexamethylenediamine, and for the polymerization and spinning processes. Laboratory work for the diamine process was in the hands of W. A. Lazier. G. D. Graves handled problems of making the finished polymer and of spinning.

Textile operations with respect to the yarn were assigned to the Rayon Department under the direct supervision of G. P. Hoff. Pilot plant operations began in the newly organized Nylon Division of the Rayon Department under the management of E. K. Gladding, formerly assistant manager of the Rayon Technical Division.

Three-and-a-half years from the selection of "superpolymer 66", pilot plant production was under way and in less than five years, the first full scale plant began operations at Seaford, Delaware. Except for size, this commercial plant was a duplication of pilot plant design. The development of processes for the manufacture of nylon intermediates, polymer, and yarn represents one of the largest cooperative projects within the experience of the Du Pont Company. Some 230 chemists and engineers were at one time or another engaged in the development from the inception of laboratory work until designs were turned over to the construction engineers.

The original nylon plant at Seaford, Delaware had been designed for a production of 3 million pounds a year. Before it started in operation, however, this figure was changed to 4 million. And before the plant was completed, facilities had been added to bring production to 8 million pounds a year. By 1940 the plant had stopped growing and started producing . . . and its product, nylon, lived up to the expectations of the more than 230 men who had brought it this far. Good quality nylon was produced from the very first — and it stood on its merits.

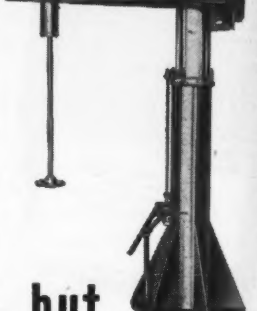
Today there are three plants producing many million pounds of nylon fibers a year.

End or Beginning?

Tremendous achievement though it was, production of practical forms of nylon at practical costs begins to look like the beginning of something bigger. There may be small share-cropper cotton farmers, small sheep herds, but there are no small synthetic fiber producers. Du Pont had spent $27 million getting the first commercial nylon plant into successful production. The much talked about "little fellow" has never spent so much or learned so much as Du Pont did on this one project.

"All beginnings are hard" according to the German proverb, and when enough had been learned to

same working space



but CAPACITY DOUBLED with a Cowles

Stymied by insufficient dissolving capacity? Then replace your present mixer with a Cowles Dissolver — it more than doubles your capacity in the same working space!

THE COWLES DISSOLVER is a high-speed unit. Its impeller operates at velocities up to 7,500 f.p.m. And that means dissolving and dispersing move 2 to 20 times faster — that you save time and labor while improving your product. It's rugged, fast-loading, easily maintained — performs tasks other mixers cannot because it's engineered to the job.

WRITE FOR CATALOG on Cowles Dissolvers! And ask to have a detailed test run on your materials — no obligation.

The Cowles Company
INCORPORATED
113 TRACKSIDE • CAYUGA, N.Y.

When inquiring check CP 2155 on handy form, pgs. 2-3

produce nylon there had been some interesting by-product knowledge turned up, too. It remained for Dr. Emmette F. Izard to pull on some of these loose ends . . . and what he pulled out was another wonder product, "Dacron" polyester fiber.

Izard went back to the point where Carothers had been stumped after drawing his early polyester fibers back in the 1930's.

Carother's fibers had had too low a melting point and had been too sensitive to water. Izard undertook a new investigation of polyesters in 1944, and within a short time produced high molecular weight polyethylene terephthalate. More familiar now as "Dacron", the fiber spun from this "superpolymer", has none of the shortcomings of its earlier counterparts. Actually, the same form of the polyester had been independently synthesized somewhat earlier in England by Dr. J. R. Whinfield and J. T. Dickson, but Izard's work was the basis of the rapid commercial development of polyester fibers in this country.

From silk, to rayon, to nylon, to "Orlon", to "Dacron", to what? The consuming public seems to have developed a curiosity about what the next miracle product will be. Rayon was fifty years gaining wide acceptance: nylon was prized and fought for at store counters in the first year of its commerical life. This points to a growing faith in the new products . . . significantly, no longer called substitutes . . . of chemical industry. E. I. du Pont de Nemours and its hard working team deserve a large portion of the credit for this change.

Mass spectrometers highlight of chemical instrument cat

Twelve-page catalog features mass spectrometers for analytical work, isotope ratio determinations, and other purposes. Along with general description of mass spectrometer operation, several specific models are shown and described.

Balance of catalog describes leak detectors, sulfur monitors, electrical computers, etc. Two-color chemical instrument catalog is issued by Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 15, Calif. When inquiring specify CP 2156 on handy form, pages 2 and 3.

Radiation detecting instrument monitors large surface areas

Designed to provide greater stability and versatility in radioactive surveys, contamination monitor covers radiation ranges from low level alpha contamination to 625 mr/hr radiation. Instrument will monitor large flat areas, irregular surfaces, or holes and corners. It is very useful in the handling of radioactive sources.

Specifications, applications and features of the Raychronix Model D-5 Samson Survey Meter are included in 4-page bulletin issued by Radioactive Products, Inc., Dept. CP, 443 W. Congress St., Detroit 26, Mich. When inquiring specify CP 2157 on handy form, pages 2 and 3.

DRYING PROBLEMS?

JUST WRAP 'EM UP AND SEND 'EM TO US . .

STRAIGHT ACROSS THE BOARD FROM ABRASIVES TO YARNS

HERE ARE A FEW OF THE PRODUCTS WE'VE TESTED IN OUR LABORATORY FOR MORE EFFICIENT DRYING

Abrasives
Apples
Asbestos
Bast Fibres
Beans
Bristles
Building Materials
Calcium Carbonate
Chemicals
Clay Fillers for paper
Cloth
Coatings
Coconut
Cotton
Dehydrated Foods
Explosives
Fertilizers
Flock
Flour
Fruits
Grain (cooling)
Hides
Hair
Kaolin
Latex
Macaroni
Metal Parts and Products
Nuts
Paints
Paper & Paper Products
Peanuts
Peat Moss
Pigments
Plastics raw stock
Printing Inks
Proteins
Pulp
Rice
Rubber—reclaimed, synthetic and natural
Salt
Sawdust
Sisal
Synthetic Fibres
Textiles—raw and dyed stock
Tobacco
Waste Sludges
Wool
Yarns

CAN YOU ANSWER THESE QUESTIONS ABOUT THE DRYING OF YOUR PRODUCT?

1. Is it dried uniformly, to exact degree desired — under complete control at every stage?
2. Are you getting maximum rate of production possible, yet maintaining automatically controlled, unvarying quality?
3. Is your drying process the most efficient possible — quality-wise, AND cost-wise? No steam or hot dry air waste? Using minimum floor area? And optimum bed depth? Would alternate airflow direction zones help, or radiant heat boosters, or varying temperature zones?
4. Is your product correctly pre-conditioned for most efficient drying? Have you ever compared drying curves to be certain that every important variable is controlled within pre-set limits — automatically?
5. Which type of dryer is best for your product — tunnel, pole, tray, truck, or special design?

SARGENT can give you the answers to these and many other questions. For better, less costly, more efficient operation of drying processes, write us.

May We Help You . . .

determine the one best commercially practical way to dry YOUR product easier, quicker, more economically? Just write us.

C. G. SARGENT'S SONS CORP.

Graniteville, SINCE 1852 Massachusetts

REPRESENTATIVES: F. E. WASSON, 519 Murdock Rd., Philadelphia 19, Pa.
A. L. MERRIFIELD, 215 Grove Ave., Cincinnati 15, Ohio
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HUGH WILLIAMS & CO., 47 Colborne St., Toronto 1, Canada

When inquiring check CP 2158 on handy form, pgs. 2-3

One of many filter presses for clarifying and for recovery, washing and partial drying of filter cake in fine chemical manufacture.

More VERSATILE • EFFICIENT WIDELY APPLICABLE

- Economical in first cost and in operation.
- Applicable for almost any filterable material.
- Capable of recovering solids, clarifying, washing, extracting, thickening, melting, redissolving—any or all in one equipment.
- Operate at any pressure or temperature, in any capacity.

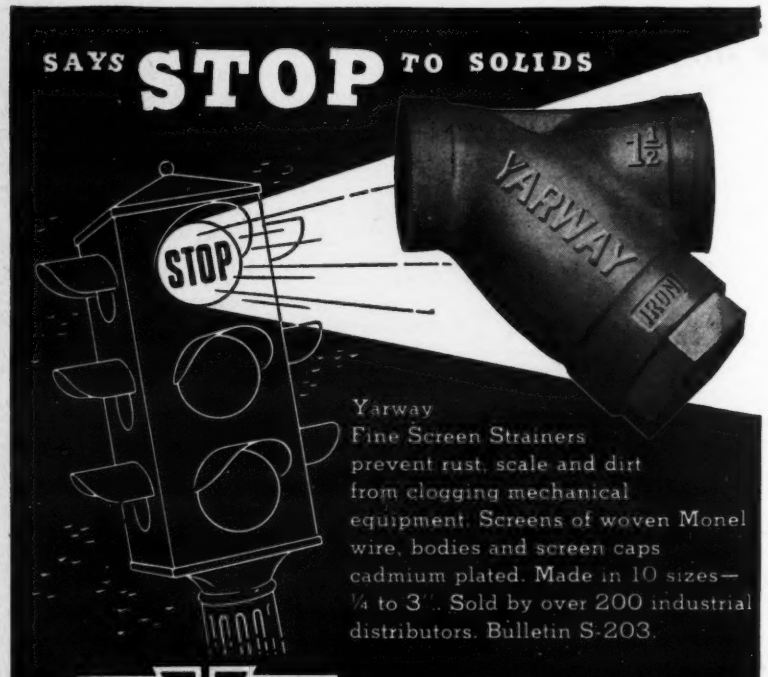
Get Catalog 52.

Shriver Filter Presses

T. SHRIVER & CO., Inc. 846 Hamilton St. · Harrison, N. J.
Filter Presses · Filter Media · Diaphragm Pumps

When inquiring check CP 2159 on handy form, pgs. 2-3

SAYS STOP TO SOLIDS



Yarway Fine Screen Strainers prevent rust, scale and dirt from clogging mechanical equipment. Screens of woven Monel wire, bodies and screen caps cadmium plated. Made in 10 sizes—¼ to 3". Sold by over 200 industrial distributors. Bulletin S-203.

YARWAY STRAINERS

YARNALL-WARING CO., 125 Mermaid Ave., Philadelphia 18, Pa.

When inquiring check CP 2160 on handy form, pgs. 2-3

NEW LITERATURE

Listing of steam and liquid control equipment

Complete line of steam, gas, air, oil, and water regulating equipment is described in 62-page catalog. Included are complete spec and operational data on line of pressure regulators, temperature regulators, diaphragm valves, motor operated valves, pop safety and relief valves, strainers, water gages, and other similar equipment.

Useful charts are also presented. These include capacity tables, flange charts, table of steam pressures and corresponding temp, and table of water head and equivalent pressures.

Cat 53 is issued by O. C. Keckley Co., Dept. CP, 400 W. Madison St., Chicago 6, Ill. When inquiring specify CP 2161 on convenient Reader Service slip between pages two and three.

Tackles problem of inedible fats

Fifty-four-page bulletin presents an economic review of the inedible fats situation, and production and uses of fatty acids. Includes a six-page listing of patents on fat and fatty acid processing methods and applications.

Bul AIC-346, "A Survey on Research Possibilities for Animal Fats," is issued by Eastern Regional Research Laboratory, United States Department of Agriculture, Philadelphia 18, Pa.

Brochure on research labs

Pointing out that industry cannot afford obsolescent plants in this period of technological programs, 8-page, illustrated brochure describes successful laboratories in a number of fields, including electronics, paints, pharmaceuticals, chemicals, antibiotics, and others.

"Research Laboratories for Industry" is issued by Walter Kidde Constructors, Inc., Dept. CP, 140 Cedar St., New York 6, N.Y. When inquiring specify CP 2162 on handy form, pages 2 and 3.

New! Enlarged! Simplified!

These Facts Can Save You Money!

A completely revised edition of the handbook that has become the "bible" of electronic control for thousands of engineers.

Newly edited, with 45 new case studies showing how standard packaged electronic controls have solved many industrial problems you're likely to meet. It explains clearly and factually, without hocus-pocus, tested ideas for achieving efficiency through "Electron-eered" counting, weighing, measuring, timing and cycling — broadly applied to industries — completely indexed.

JUST OFF THE PRESS RESERVE YOUR COPY NOW! Write:

PHOTOSWITCH INC.
Dept. CA 6, 77 Broadway
Cambridge 42, Mass.

When inquiring check CP 2163 on handy form, pgs. 2-3

WHEN BINS BECOME BOTTLENECKS... YOU NEED

SPO AIR VIBRATORS

Don't let arching, bridging and clogging bottleneck your production . . . keep materials flowing from bins, hoppers and chutes with SPO air vibrators. These low-cost units deliver powerful hammer-like blows which eliminate jamming of powdered and granular materials.

Exclusive feature of SPO air vibrators is a special corrosion-proof bronze alloy cylinder liner which assures full-power start, high-speed operation, low air consumption and maximum service life. 1222-S1

Write today for Bulletin 50.

SPO INCORPORATED

GRAND DIVISION AVE. • CLEVELAND 25, OHIO

When inquiring check CP 2164 on handy form, pgs. 2-3

Deals with complete line of spectrophotometers

Two-color, 28-page bulletin contains comprehensive information on ultraviolet and visible spectrophotometers — picturing all sample cells and other accessories. Auxiliary units for use in flame, reflectance and fluorescence analyses are also described. An extensive section is devoted to a discussion of complete line of spectrophotometer cells, interchangeable sample compartments and cell adapters.

Bul 303-11 is issued by Beckman Instruments, Inc., Dept. CP, South Pasadena 1, Calif. When inquiring specify CP 2165 on convenient Reader Service slip between pages two and three.

Revised edition of air conditioning manual available

A recently revised edition of company's air conditioning manual has been announced as available. A chapter has been added to the book to cover fan application and selection, basic fan laws, duct design data, and nomenclature. This chapter adds complete information on design of air handling systems for air conditioning.

Manual begins with a simplified presentation of the basic physical laws governing heat and cold, and applies these laws to practical problems in air conditioning. A chapter on comfort and the physiology of human heat control mechanism illustrates comfort standards. Other subjects covered are heat gain and loss, properties of air and the psychrometric chart, refrigeration, and calculations for conditioned air supply.

Text is illustrated with drawings, photos, charts, and graphs. Problems at the end of each chapter show practical applications; answers are given in a separate section. A reference section contains standard tables on air, refrigerants, pipe capacities for refrigerant liquid and vapor, and ducts.

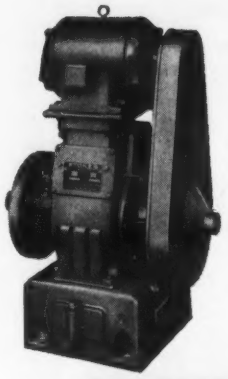
To obtain Air Conditioning Manual remit $5.00 direct to The Trane Co., Department CP, La Crosse, Wisconsin.

Single source for full line of process equipment

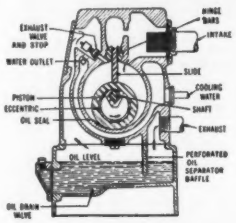
Twelve-page bulletin emphasizes how manufacturer can supply complete milling equipment — from testing, to feeder, to dryer. Photographs show a good representation of equipment line, and all items are listed in alphabetical order, with sizes and capacities. List includes mixers and blenders, crushers and grinders, hoists and conveyors, classifiers, thickeners and flotation machines, filters, dryers, and many others.

Details on testing laboratory are presented. Bul G3-B39 is issued by Denver Equipment Co., Dept. CP, 1400 17th St., Denver, Colo. When inquiring specify CP 2167 on handy Reader Service slip, pages 2 and 3.

Cut Costs...Boost Efficiency...with Stokes High Vacuum Pumps



At left is the new Model G Stokes High Vacuum Pump. Basically, and in outward appearance, the new model is the same simple, efficient, compact and reliable unit as its widely used predecessor, Model F. Five major engineering improvements are incorporated in the new model: 1) a new mechanical face-seal minimizes routine maintenance and reduces to a minimum the possibility of oil leakage at the shaft; 2) new exhaust valve-stops permit use of these pumps in an exceptionally broad range of applications, including rapid cycling evacuation of large-volume systems; 3) a new intake screen filter prevents damage by dirt, scale, and other solids sometimes present in the system; 4) a new oil filter in the line to the shaft seal affords special protection to the bearings at these points; 5) a new solenoid valve in the oil supply line automatically prevents oil-flooding of the pump in the event of power failure.



The operating principles of the Stokes High Vacuum Pump are simple. Rotation of the Stokes Pump is indicated in cross-section view at left: Air enters the increasing space at right of piston, while air trapped in the decreasing space at left of piston is compressed. As piston nears top of stroke, pressure of the trapped air opens the feather-type discharge valve against atmospheric pressure, and the air is forced out of the cylinder. As piston passes through its top position, the suction port is momentarily closed by piston. Air then present in cylinder is trapped, a new cycle begins.

A completely revised brochure on Stokes High Vacuum Pumps is now available, free, upon request. It explains, and shows, how Stokes Pumps combine simplicity of design, high volumetric efficiency and lowest operating costs to provide reliable, continuous service for all kinds of high vacuum processing equipment. Examples of typical vacuum systems using Stokes Pumps are cited and typical problems in pump selection and their solution are provided. Also described is the complete line of Stokes High Vacuum Processing Equipment and the new Stokes Experimental and Applications Laboratory in Philadelphia, Penna.

The new Stokes Vacuum Calculator for rapid slide-rule calculations, including a standard ABCD log scale, is now available, free, upon request. It has proved to be of tremendous value to those engaged in vacuum research and processing, seeking to determine the proper pump to be installed for a specific process. This easy-to-use slide-rule simplifies the job of figuring the needed pump capacity to evacuate a given volume to a specified vacuum in a given time, and the time required to evacuate a given volume to a specified vacuum with the user's present vacuum pump. Vapor pressure of water at various temperatures is given, together with the boiling-points of solvents under vacuum and the capacity of round tanks in both cubic feet and gallons per foot of depth. Another table shows vapor pressures at various temperatures for use in vacuum metallurgy.

Simplicity and sturdy construction, accessibility, high volumetric efficiency, low power consumption, and effective cooling are distinctive features of Stokes High Vacuum Pumps.

Better blank-off pressures and quieter operation are assured with a completely new, longer lasting exhaust valve assembly. Intake ports are open during the entire intake cycle; there is no slide-valve shut-off.

Lubrication is completely automatic. There are no oil shut-off valves and adjustments. Horizontal vacuum intake permits trapping of harmful dirt and scale. Vacuum-tight rotary seals eliminate the need for shaft packing and constant adjustment. Easy access is provided to the valve assembly and other parts requiring periodic examination.

Stokes High Vacuum Pumps are available in capacities from 15 to 500 cfm. Where necessary, oil purification units — to assure continuous supply of clean, water-free oil — can also be furnished.

Wherever hard, continuous service is required to meet today's exacting high vacuum requirements, Stokes High Vacuum Pumps prove a profitable investment.

Consult with Stokes on the application of vacuum to drying, freeze-drying, impregnation, extraction, solvent recovery, evaporation, vacuum metallizing, and to other purposes for which vacuum deserves exploration.

F. J. STOKES MACHINE COMPANY
PHILADELPHIA 20, PA.

STOKES

STOKES MAKES: High Vacuum Equipment, Vacuum Pumps and Gages/Industrial Tabletting, Powder Metal and Plastics Molding Presses/Pharmaceutical Equipment

When inquiring check CP 2168 on handy form, pgs. 2-3

NEW!

Model 100

NEPTUNE PROPORTIONING PUMP

Simplex Model 100 S. $143.00

Duplex Model 100 D. $188.00

Motor price additional

READY... the new Neptune Pump which offers *three-way economies!* First, Model 100 is an astonishingly low-priced Chemical Proportioning Pump. Second, the advanced design delivers efficient and accurate performance. Third, the compact simplicity achieves low maintenance costs. Write for literature.

Simplex or Duplex
0-12 GPH
Pressures to 300 PSI

NEPTUNE PUMP MFG. CO.
4912 North 6th Street · Philadelphia 20, Pa.

When inquiring check CP 2169 on handy form, pgs. 2-3

DESIGN ASSISTANCE
• DEPENDABILITY
• ENGINEERING SKILL
• EXPERIENCE
• ECONOMY

from M & L to You...

The finest Heat Exchange Equipment that top flight materials and Engineering Ingenuity can produce.

You specify the conditions—Our engineers will establish the size, type, material and pressure specifications.

Send for bulletin 810 showing how M & L can help you solve your process equipment problems.

Manning & Lewis Engineering Co.

30 Ogden Street Newark 4, New Jersey

SALES REPRESENTATIVES IN PRINCIPAL CITIES

M&L

When inquiring check CP 2170 on handy form, pgs. 2-3

NEW LITERATURE

Selection guide for motor starters

Tips on selecting the right starter for squirrel-cage induction motors rated up to 600 hp at 600 volts or less are contained in 4-page, 2-color bulletin. Information included in bulletin tells how to select proper type starter, enclosure, and operating arrangement, and explains how to determine whether a full or reduced voltage starter should be used.

Explanation of two or three-wire control, and hints on selection of heater elements for overload relays are also given in bulletin along with a cage motor starter selection chart.

Bul 14B7733 is issued by Allis-Chalmers Mfg. Co., Dept. CP, 1151 S. 70th St., Milwaukee, Wis. When inquiring specify CP 2171 on handy form, pages two and three.

Bulletin discusses plastic pipe

Designed to be of help to pipe users faced with problems of corrosion, two-page folder describes company's plastic pipe known as Black Buty.

Included in literature are specifications for pipe from ½" to 6" diameters; estimated working pressures; data on chemical resistance; fittings available; and typical applications.

Bulletin on Black Buty is issued by Anesite Co., Dept. CP, 3575 Touhy Ave., Chicago 45, Ill. When inquiring specify CP 2172 on handy form, pages 2 and 3.

Graphic folder shows handy reagent bottle

Designed for easier handling and to reduce required shelf space, improved reagent bottle is illustrated in graphic brochure. Advantages and features of packaging system are outlined and pictured.

Bul 5578 is issued by Mallinckrodt Chemical Works, 2nd and Mallinckrodt Sts., St. Louis 7, Mo. When inquiring specify CP 2173 on form, pages 2 and 3.

when you go courting lower costs

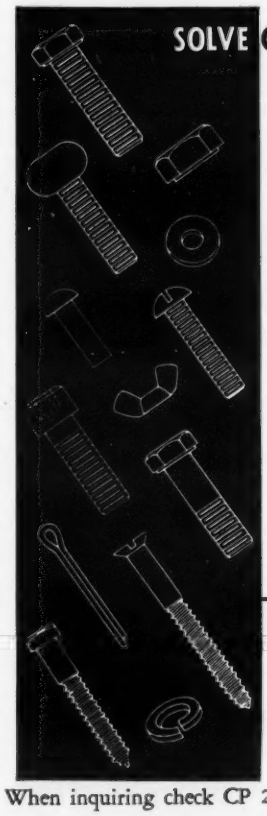
first check the SPRAY NOZZLES used in the system

More exact spray nozzle design...with nozzle capacity better adapted to the character of the liquid being sprayed can often materially improve spraying operations and lower your costs. That's why Spraying Systems Spray Nozzles are worth checking. Thousands of types and capacities to choose from. Designed and built by America's leading spray nozzle manufacturers. The most widely used nozzles in America today among equipment builders and engineering firms.

WRITE TODAY... let us send you General Catalog No. 22 and Pneumatic Atomizing Nozzle Catalog No. 23. Scores of Data Sheets also available covering specialized applications.

SPRAYING SYSTEMS CO.
321A Randolph Street
BELLWOOD • ILLINOIS

When inquiring check CP 2174 on handy form, pgs. 2-3



SOLVE CORROSION PROBLEMS!

Select HARPER *Everlasting Fastenings*

Harper can supply corrosion-resistant fastenings to meet every need. Call Harper for bolts, nuts, screws, washers, rivets and special fastenings of brass, silicon bronze, naval bronze, Monel, aluminum, all stainless steels. Over 7,000 different items ready for prompt delivery. See your Harper Branch or Distributor or write for catalog.

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EVERLASTING FASTENINGS

The H. M. Harper Company
8241 Lehigh Avenue
Morton Grove, Illinois
Please send me Harper Catalog 25.

Name.....
Company.....
Address.....
City.....State.....

When inquiring check CP 2175 on handy form, pgs. 2-3

Current materials on safety presented in catalog

This 52-page service guide should provide company safety directors with a complete catalog of many and varied accident prevention aids. In the guide, company safety men will find not only the tools they need to build their safety programs, but also the training aids available for instructing supervisors and workers.

For the safety man, the catalog offers periodicals, newsletters, and a complete library of technical and administrative publications covering all phases pertinent to occupational accident prevention.

To assist the foreman, the service guide offers a monthly magazine, 24 training films that show supervisors how to use basic human traits in building a better safety program, and several hundred made-to-order five-minute safety talks.

Service Guide 2.1 is available from the National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill. When inquiring specify CP 2176 on convenient Reader Service slip between pages 2 and 3.

Gives data on redesign of twin-screw extruder

Four-page bulletin describes redesigned twin-screw extruder for pipe, sectional extrusions, compounding, and coloring. Changes have been made in design to provide more effective lubrication, simplify cleaning and disassembly, and speed set-up and tear-down time. Specifications of the unit are tabulated (nominal capacity, 100 lb/hr), and types of products being handled are listed.

Bul 550 is issued by F. J. Stokes Machine Company, Dept. CP, 5500 Tabor Rd., Philadelphia 20, Pa. When inquiring specify CP 2177 on handy form, pages 2 and 3.

Tells how to size-reduce 190 different materials

Pocket-size, 12-page booklet is handy guide to types of manufacturer's reduction machinery to use for more than 190 specific materials. Each type of breaker, crusher, shredder, mill and pulverizer is given a code number and this is used in the alphabetical tabulation of material to be ground. Listing shows equipment for reducing the specific material to each of these four size ranges: 1 to 3", ⅛ to 1", 50 to 10 mesh, and 50 mesh and below.

"Gruendler Products for the Chemical and Related Industries" is issued by Gruendler Crusher & Pulverizer Co., Dept. CP, 2915-17 N. Market St., St. Louis 6, Mo. When inquiring specify CP 2178 on convenient Reader Service slip between pages two and three.

R-S valvEvents

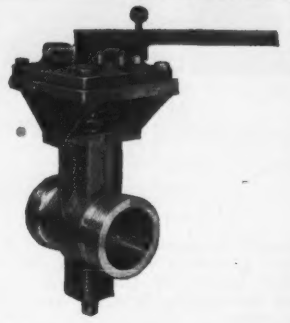
• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •

R-S Valves provide quick opening yet tight means of overflow control. Photograph courtesy William Allen Son's Company, Worcester, Mass.

Specify R-S VALVES

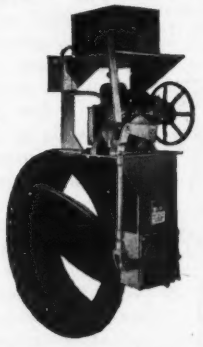
- for simplified and economical control and shut-off of volume and pressure
- with metal to metal seat including babbit or rubber seat
- for manual or any type of automatic control
- for any material that flows or is forced through a pipe
- in any material that can be cast or welded including plastics and certain alloys especially adapted to resist corrosion, erosion and temperature.
- in all sizes for all industries and processes, and in the temperature range from minus 300° to plus 2000° F. 2 to 2500 psig.

Representatives are listed in telephone directories as: "R-S Products Corporation Valves".



No. 674—Special 2½-inch stainless steel valve with 150 psi construction. Standard sanitary type threads. Heavy duty handlever assembly Type No. 681.

No. 848—Heavy duty valve with rubber seat for water service at high velocity. Handwheel operates valve through spur gear and pinion into a threaded reach rod (enclosed Type No. 700) in order to obtain sufficient torque to seat disc in rubber.



No. 847—Heavy duty valve with electric motor operator mounted directly above valve and positioned by pressure controller mounted above the motor.

Consult your local R-S Valve Engineers, or write direct.

R-S PRODUCTS CORPORATION • 4600 Germantown Ave., Philadelphia 44, Pa.

An S. Morgan Smith Company Subsidiary

DISTRICT OFFICES IN PRINCIPAL CITIES

When inquiring check CP 2179 on handy form, pgs. 2-3

"DAVENPORT"

CONTINUOUS PADDLE

DEWATERING SCREEN

Recovering Waste Pulp

If concentrating the suspended solids is a problem in your process, it would pay you to investigate the Davenport Continuous Inclined Paddle type Dewatering Screen. Write for our complete catalog.

For quick reference see "Sweet's 1952 Processing Industries" file or "Chemical Engineering Catalog" — 1953.

DAVENPORT

De watering Presses and Screens.

ROTARY

Steam Tube, Hot Air and Direct Fire Dryers.

Water Tube and Air Coolers

DAVENPORT MACHINE and FOUNDRY COMPANY

DAVENPORT 4, IOWA

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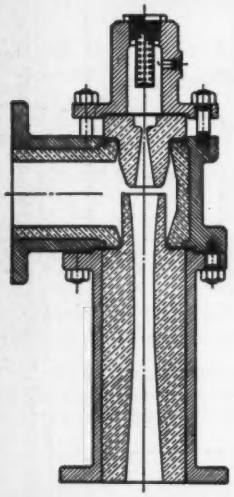
C-R EVACTORS

MEET CORROSION PROBLEMS



The chemical industries are employing more and more Croll-Reynolds Evactors in vacuum processes where corrosion resistance is a major consideration. These steam jet vacuum units provide pressures ranging from a few inches to a few microns. Croll-Reynolds is a pioneer in the use of new construction materials and our engineers are investigating corrosion problems continually.

Stainless steels, Monel metal, Beryllium copper, Ni-Resist, PMG metal, hard lead, special bronzes, Hastelloy, and Illium are but a few of the special metals which find their way into our equipment. Carbon is used extensively as a lining material, and many plastics including Teflon and synthetic materials are used for making complete Evactors.

Consult our engineers for high vacuum equipment carefully designed for your specific conditions, and constructed of materials selected for your particular conditions.

Please address Department B

CROLL-REYNOLDS CO., Inc.

Main Office:
751 Central Ave., Westfield, N. J.
New York Office:
17 John Street, New York 38, N. Y.

CHILL VACTORS • STEAM JET EVACTORS • CONDENSING EQUIPMENT

When inquiring check CP 2181 on handy form, pgs. 2-3

NEW LITERATURE

Catalog tells story of industrial heaters

Complete story on standard and heavy-duty, centrifugal-fan industrial heaters is told in 32-page catalog. Standard industrial heaters are used to heat manufacturing bays, warehouses, garages, and other large areas where conventional heating equipment is inadequate. Heavy-duty industrial heaters are particularly suited for use in steel mills, paper mills, rubber plants, and large manufacturing industries. They are used with high-pressure steam systems and have a wrought-iron construction.

Information on where to use heaters, at what circulating capacities and temperatures, and how to place them is given in an application section of bulletin. Another section explains automatic temperature control and tells how to estimate heat load a particular heater must carry for efficient operation.

As an aid to selection, a set of typical dimensions is given and typical examples are worked out. Also towards this aim, tables and graphs of performance data are given as well as outline dimensions of the units. Other sections cover construction features, accessories, and instruction for installation.

Cat 1510 is available from Dept. T-025, Sturtevant Div., Westinghouse Electric Corp., Dept. CP, 200 Readville St., Hyde Park, Boston 36, Mass. When inquiring specify CP 2181A on handy form, pages 2 and 3.

Data on complete line of hydraulic cylinders

Complete line of hydraulic (oil) cylinders is covered in 32-page bulletin. General description of cylinders is presented, but bulk of information is detailed specifications on the several types available. Engineering data including size determination and installation suggestions is given.

Bul 52-55 is issued by Industrial Products, Vickers, Inc., Dept. CP, 1582 Oakman Blvd., Detroit 32, Mich. When inquiring specify CP 2182 on handy form, pages 2 and 3.

90 Pages of Helpful Information on STAINLESS Tubing and Pipe

The CARPENTER STAINLESS TUBING HANDBOOK is a mighty handy reference to have at your fingertips when you want quick answers to design engineering and processing problems involving stainless tubular products. It contains a wealth of easy-to-find technical data conveniently cross-indexed under 150 subjects relating to—selection and specification . . . corrosion resistance . . . heat resistance . . . heat transfer . . . general physical properties . . . sizes and gauges . . . tolerances . . . fabrication and assembly . . . special shapes . . . finishing.

IT'S YOURS FOR THE ASKING—to get your personal copy of the Carpenter Stainless Tubing Handbook promptly, just write us on your company letterhead.

THE CARPENTER STEEL COMPANY

Alloy Tube Division, Union, N. J.

When inquiring check CP 2183 on handy form, pgs. 2-3

WHEN IN NEED OF MATERIALS, PARTS OR EQUIPMENT Used in the

CHEMICAL INDUSTRY

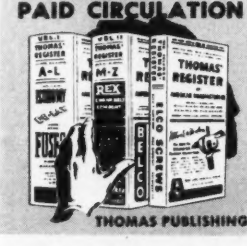
LOOK FIRST IN T. R.

..the encyclopedic "guide to buying"

T. R. provides more accurate and complete "where-to-buy" information and purchasing data than all other sources combined. 10,384 Advertisers use 38,943 advertisements in the 1953 Edition.

THOMAS REGISTER

PAID CIRCULATION



The National Purchasing Guide for all Industry!

THOMAS PUBLISHING COMPANY, 461 - 8th AVE., N.Y. 1, N.Y.

When inquiring check CP 2184 on handy form, pgs. 2-3

Convention & Exhibit Schedule

1953

June 15-17. The National Fertilizer Association, 28th annual convention, Greenbrier Hotel, White Sulphur Springs, West Virginia.

June 15-19. Exposition of Basic Materials for Industry, Grand Central Palace, New York, N. Y.

June 15-25. Lubrication Engineering Short Course, Northwestern University, Evanston, Ill.

June 16-19. American Welding Society, Welding & Allied Industry Exposition, Shamrock Hotel, Houston, Tex.

June 22-*July* 3. Massachusetts Institute of Technology, summer session on feedback control systems, Cambridge 39, Massachusetts.

June 29-*July* 3. American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

Aug. 19-21. Western Electronic Show & Convention, Civic Auditorium, San Francisco, Calif.

Aug. 31-*Sept.* 1. Natural Resources Research Institute, University of Wyoming, third biennial briquetting conference, Banff Springs Hotel, Alberta, Canada.

Sept. 6-11. American Chemical Society, 124th National Meeting, Chicago, Ill.

Sept. 13-16. Electrochemical Society, 104th meeting, Wrightsville Beach, North Carolina.

Sept. 13-16. American Institute of Chemical Engineers, Fairmont and Mark Hopkins Hotels, San Francisco, California.

Sept. 17-19. American Association of Textile Chemists and Colorists, annual convention, Conrad Hilton Hotel, Chicago, Ill.

Oct. 6-8. Electric League of Western Pennsylvania, Fourth Industrial Electric Exposition, William Penn Hotel, Pittsburgh, Pa.

Oct. 19-22. Society of Industrial Packaging & Materials Handling Engineers, short course at Massachusetts Institute of Technology, Boston, Mass.

Oct. 19-23. National Safety Council, 41st National Safety Congress and Exposition, Chicago, Ill.

Sept. 21-25. Instrument Society of America, Eighth National Instrument Conference and Exhibit, Chicago, Illinois.

Oct. 26-27. National Association of Suggestion Systems, annual meeting, William Penn Hotel, Pittsburgh, Pa.

Oct. 27. Association of Consulting Chemists and Chemical Engineers, Inc., 25th Anniversary Meeting, Hotel Belmont Plaza, New York, N. Y.

Oct. 29-31. Federation of Paint & Varnish Production Clubs, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

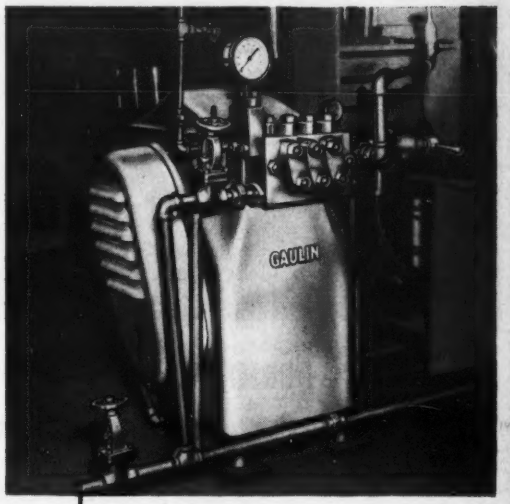
Nov. 2-4. American Oil Chemists' Society, 27th Fall Meeting, Hotel Sherman, Chicago, Ill.

Dec. 13-16. American Institute of Chemical Engineers, Annual Meeting, St. Louis, Mo.

Improved LATEX

for Thread and Dipped Goods is made with a...

GAULIN HOMOGENIZER



Globe Manufacturing Company's installation at Fall River, Mass., showing a 125 GPH Gaulin Homogenizer for processing latex.

A latex with better properties is now made in a Gaulin Homogenizer at pressures as high as 2500 PSI. Coagulation, formerly considered a necessary result of high pressures, never gets started in the short time particles are homogenized in a Gaulin.

Manufacturers find Gaulins provide a *more uniform* latex.

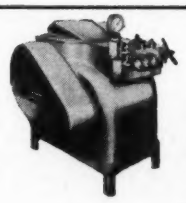
Viscosities can be accurately set . . . evenly controlled.

The *smoother consistency* of Gaulin-Homogenized latex improves filtration characteristics. Lack of lumps reduces residue on filter, prevents plug-up in extruder nozzles.

And once Gaulin-Homogenized, compounding ingredients are thoroughly dispersed throughout the latex.

Presently used for preparing either compounding ingredients or latex pastes . . . for dipping or extruding.

Complete test results can be furnished on request. Write today.



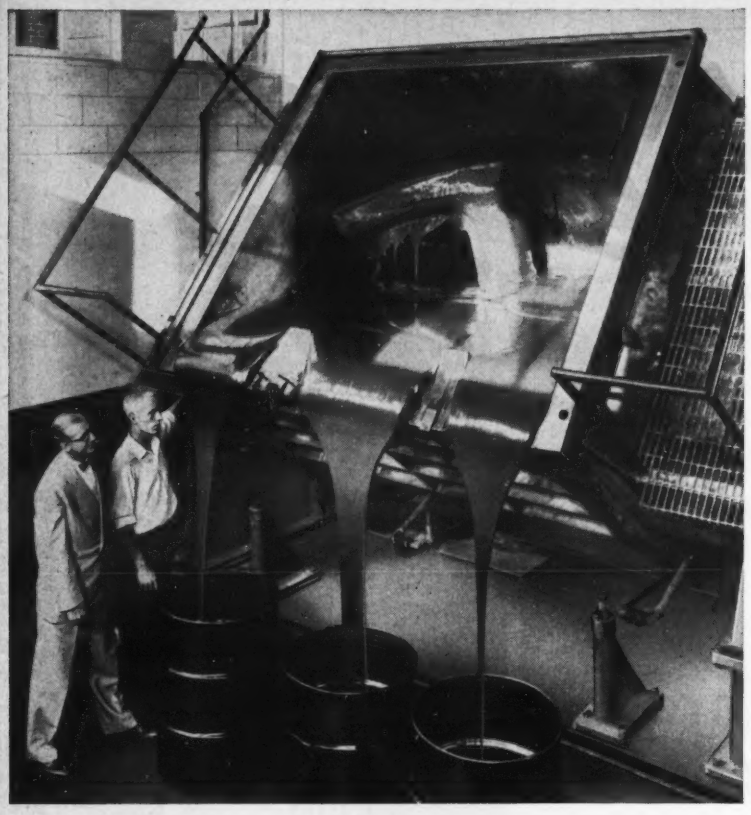
GAULIN HIGH PRESSURE PUMP

All Stainless-Steel Sanitary Construction. Handles liquids up to 400,000 CPS. High efficiency makes ideal for metering. So sturdy, moves many abrasive products with little wear. Pressures up to 10,000 PSI Capacities up to 4000 GPH. Write for Bulletin 850.

Gaulin TRADE MARK

Manton-Gaulin
MANUFACTURING COMPANY, INC.
55 GARDEN STREET, EVERETT 49, MASS.
World's largest manufacturer of Homogenizers, Triplex Stainless-Steel High Pressure Pumps, and Colloid Mills

When inquiring check CP 2185 on handy form, pgs. 2-3



BAKER PERKINS builds world's largest color blending machine

Now in operation at the Hilton-Davis Chemical Company's plant in Cincinnati, this huge blender and flushing machine, designed and built by Baker Perkins Inc., mixes 1000 gallons of flushed colors at one time. That's roughly 15,000 to 30,000 lbs., depending on the specific gravity of the colors, nearly three times the capacity of any other blender in use today. The unit weighs 21 tons and took two years to design, construct and install.

You may not need the world's largest color blending machine, but you can't go wrong if you rely on the company that can build one. When you need good, dependable chemical mixing machinery that will help increase your production and keep your maintenance and operating costs low, it will pay you to consult a BAKER PERKINS sales engineer or write us today.

248-A

BAKER PERKINS INC.

CHEMICAL MACHINERY DIVISION • SAGINAW, MICHIGAN

When inquiring check CP 2186 on handy form, pgs. 2-3

Discussed in This Issue - - -

PROCESSES, EQUIPMENT and MATERIALS

☆ Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to pgs. 2-3 and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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What's A "New Solution"?

●

It's an article in CHEMICAL PROCESSING describing a new way of solving a tough plant operating problem.

In each issue you will find specific "case histories" showing how these processing problems were solved.

Each article states the operating problem . . . explains the process used and gives details of how problem was solved . . . shows results secured.

Take a look at "New Solutions" articles in this issue — they might suggest a "solution" for some of your tough processing problems.

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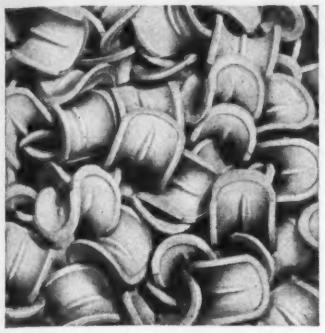
KNIGHT-WARE
CHEMICAL EQUIPMENT



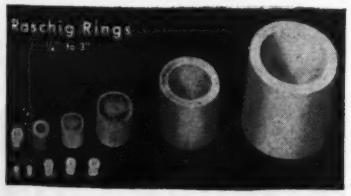
BERL SADDLES
TOWER PACKING

More Area
Higher Capacity
Less Resistance

Knight-Ware Berl Saddles are replacing raschig rings in many applications because of greater efficiency per unit volume. Berl Saddles offer larger effective surface area with less resistance to gas flow, better internal distribution plus higher loading capacity. Made from selected de-aired, washed clays, they will withstand severe acid service, have a high crushing strength and will not spall.

Berl Saddles are also available in porcelain. Both the Knight-Ware and Porcelain types are dense but not glazed so as to provide better wetting. When desired, porous packings can be made of either material. Berl Saddles are available in 1/4", 1/2", 3/4", -1" and 1 1/2" sizes. The 1/4" Berl Saddles are especially suited for use in laboratory columns.

Maurice A. Knight also manufactures raschig rings of the same quality materials. They are available in 1/4", 3/8", 1/2", 5/8", 1", 1 1/4", 1 1/2", 2" and 3" sizes in either Knight-Ware or porcelain.



MAURICE A. KNIGHT
406 Kelly Ave., Akron 9, O.
Acid and Alkali-proof Chemical Equipment

When inquiring check CP 2188 on handy form, pgs. 2-3

PROMPT
ROTOJET TUBE CLEANER
SERVICE

Prevents costly delays

It is a tribute to the durability of ROTOJET Tube Cleaners that so many of them outlive the equipment for which they were bought. Why wait until your tube cleaners wear beyond repair when an inexpensive adjustment or parts replacement can put them into first class condition again?

Do This Now—

Examine your motors, hose, and couplings, and check your stock of heads and brushes. Let our trained mechanics make any necessary adjustments. Do it now, and they'll be ready when you need them.

For Prompt Service and Delivery
YOUR BEST BET IS
ROTOJET®

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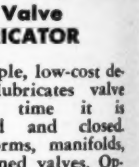

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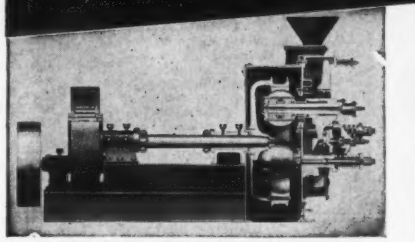

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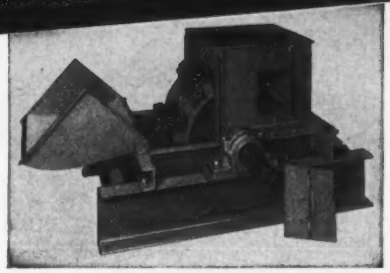

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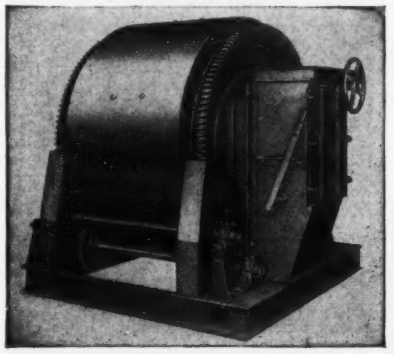

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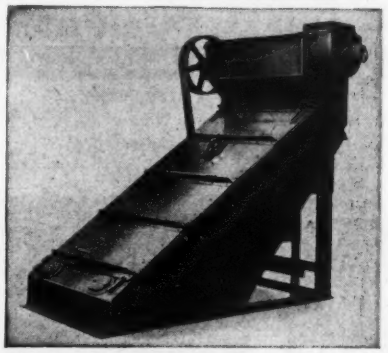

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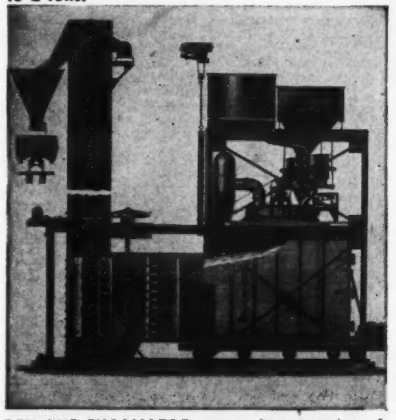

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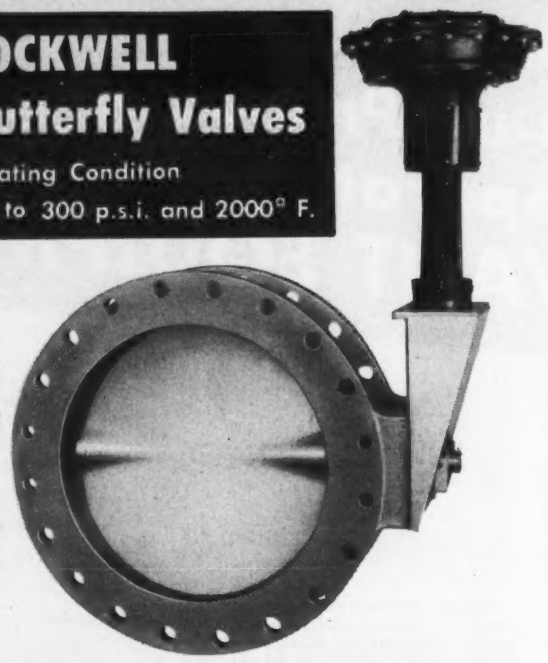

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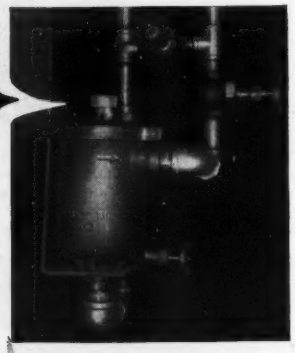

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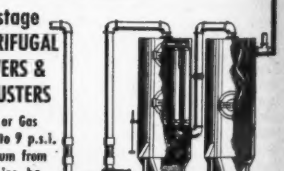

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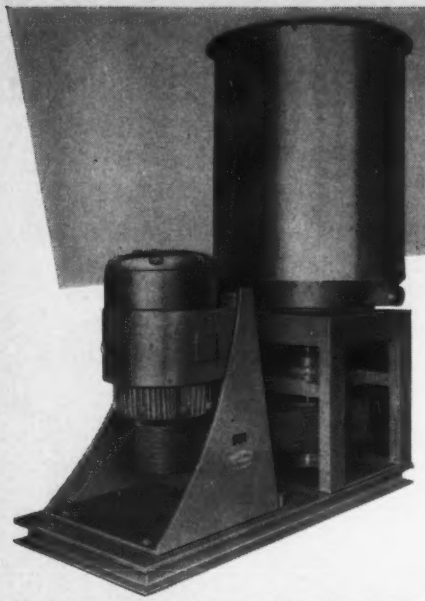

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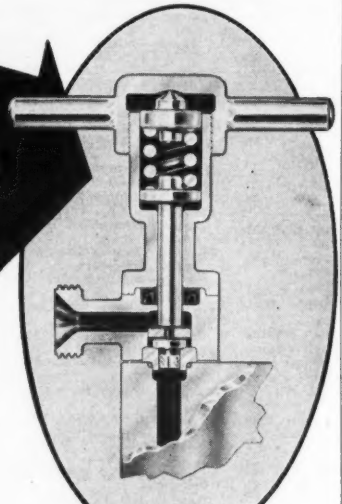

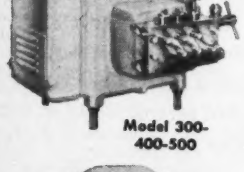

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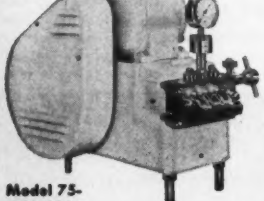

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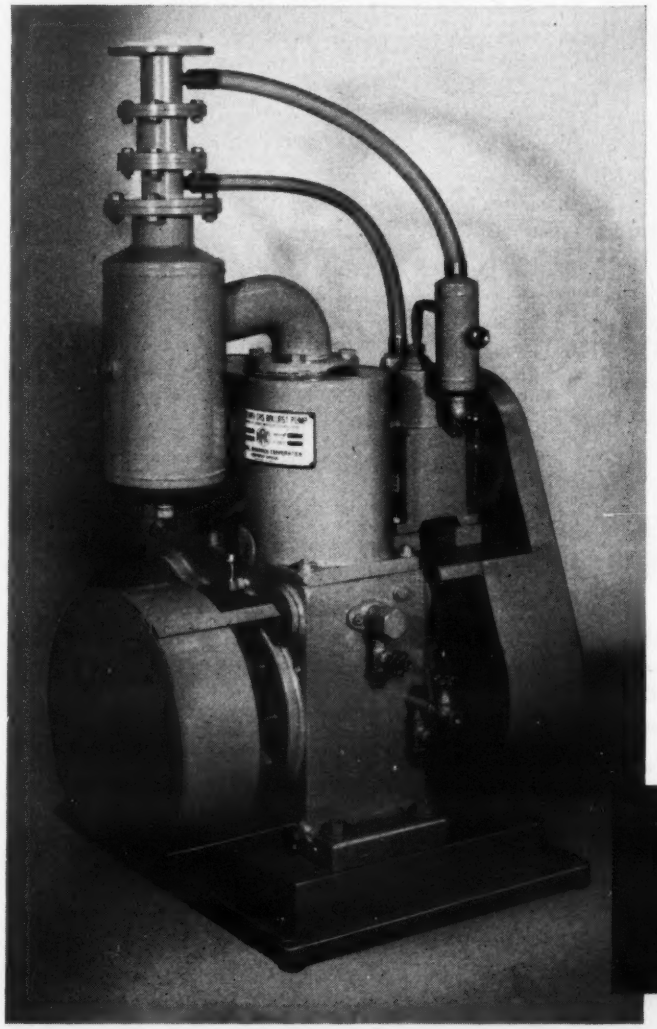

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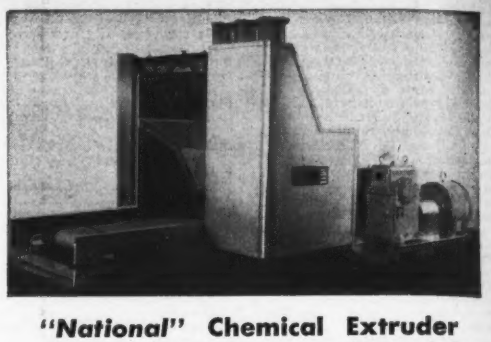

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"That's Interesting"

Shrink-proof fabrics with infra-sonics

The Hatay textile stabilization process is said to produce major economies in both cost of equipment and processing of shrink-proof fabrics. Utilizing infra-sonic impacts instead of chemicals, the process has enabled knitted cotton wear, woven fabrics, and synthetics to be controlled to acceptable commercial degrees of residual shrinkage. Arthur D. Little, Inc., Cambridge research organization has been associated in the development of the process which is based on fundamental studies in Britain.

Electric typewriters have changeable type bars

The International Business Machines Corporation, 55 Liberty St., New York, N. Y., are able to provide electric typewriters with changeable type bars. Designed for use in operations that require chemical or other scientific symbols, the type bars can be easily inserted by the typist.

Ultraviolet catalysts

Ultraviolet light, which can give you a winter tan or kill deadly germs in the air, is being used in the chemical industry to "trigger" many basic processes. A major application of the UV light is at Hanovia Chemical & Manufacturing Co., where it is used in the production of the insecticide benzene hexachloride. Rays from the automatic, mercury-arc lamp are used to exert a catalyzing effect on such chemical reactions as halogenation, oxidation, hydrolysis, polymerization, and isomeric transformation.

Stop snoring— or else!

A plastic gag to be inserted in the mouth at bedtime has been invented by Elsa L. Peppich of Seattle, Wash. Patent number 2,627,268 identifies the plastic sheet, which is oval shape but narrow in the middle where it fits under the nose. Chronic snorers wearing the gag will either breathe through their nose or not at all.
(*Modern Plastics*)

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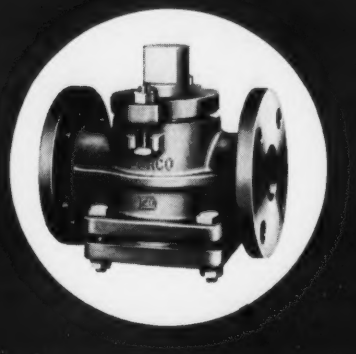

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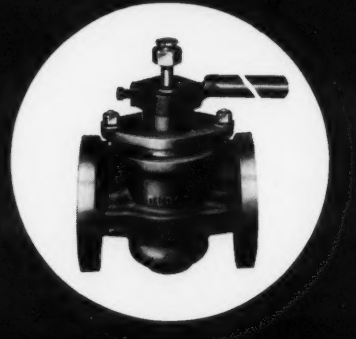

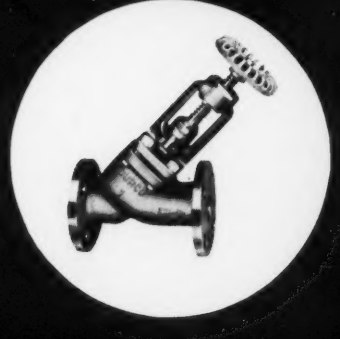

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PAPER: BECKAMINE urea-formaldehyde resins (for adding wet strength, improving the wet rub of starch-clay coatings, and waterproofing starch adhesives); RCI inorganic chemical pigment colors (for paper coloring); STYRESOL styrenated alkyd resins (for paper coating).

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